CLUSIVE CUTAWAY: CORVETTE SUPER SPORTS

SPORTS CARS ILLUSTRATED

AUGUST 1957 35¢

PORTAGO PORTRAIT

BY KEN W. PURDY

3 ROAD TESTS:

- PLYMOUTH'S FURY
- LANCIA SPYDER
- MORRIS 1000

Designer Donald Healey at the wheel of the new 100-Six in Nassau

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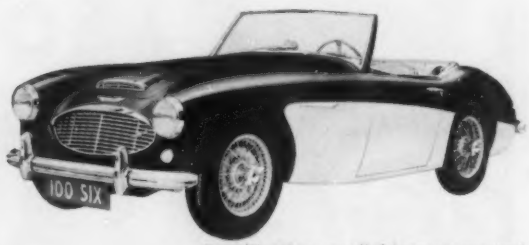

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Gathered together are the three types of Corvettes used, maybe for the last time, in competition. Top to bottom: SR-2, SS and standard hardtop. Ekta-chromes by Christy and Ludvigsen.

SPORTS CARS ILLUSTRATED

Incorporating AUTO MECHANICS

august 1957
no. 2 vol. 3

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A ZIFF-DAVIS PUBLICATION

NOTE: Sports Cars Illustrated's companion magazine, Auto Mechanics, has suspended publication with its May-June issue. Many of the fine features it held will appear in this and future issues of Sports Cars Illustrated.—The Editors.

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letters

home-grown items

I very much enjoyed your article on Martin Tanner's Special and also the ones on Eyerly's and Poole's cars. I think it is very encouraging to many readers that a modest amount of money and a lot of ambition and ingenuity can develop an automobile that will beat the best from Europe.

The last few months' improvements in your magazine are causing it to become the favorite sport car magazine of many readers. Keep up the good work.

Sincerely,

E. S. Mac Arthur, President
Class H Car Club

legal aid

I noticed with much interest in the March issue of SCI the letter of Mr. William Olthoff of North Bergen, New Jersey, about the difficulties he has had insuring his 1600 Porsche.

Being a sports car enthusiast and owner of sports cars myself and also being in the insurance business, I have lately had many calls from a number of people asking for help with their insurance, especially since the new law for Liability and Property Damage Insurance went into effect in New York State.

The fact of the matter is that no insurance company has the right to increase its rates on Property Damage Insurance because of a foreign car which on Liability and Property Damage takes exactly the same rate as an American automobile.

Mr. Olthoff in North Bergen, New Jersey, has a basic rate of $54 on $10/20,000. Liability Insurance and a basic rate of $22 on $5,000 Property Damage Insurance on his Porsche car — providing the car is used for pleasure only and that he is over 25 years of age. To give him some idea of how a rate can increase, however, he must understand that if he is under 25 this rate would be increased approximately three times. He also should realize that if he uses his car for business, for instance, and is over 25, there would be an increase from $54 to $82.80 and from the $22 to $34. This, however, has nothing to do with the particular car and these rates apply to European as well as American cars.

As far as Fire and Theft are concerned, the rates applying to foreign cars on Fire and Theft Comprehensive as well as on Collision do not vary greatly from those of the American automobiles.

It might also be of interest to know that if a person owns two or more cars, these can be instred under a "One Chauffeur Warranty" providing one car is used at a time which means that the second and third car would only cost 25% of the first car's insurance rate. Up to January 30, 1957 this type of saving was also pos-

(Continued on page 8)

very sincerely yours:

LAST month's report by Dr. George Snively on the helmet tests being undertaken under his direction has a sequel. Virtually every helmet manufacturer concerned has taken immediate steps to include nonresilient lining in their products. Among the first, as indicated in the report, was Roy Richter who manufactures the Bell helmet. Hard on his heels was Gentex. And a phone call from Tony Pompeo, U.S. distributor of the Machpi, gave us the word that Tony is having his entire stock relined. He also said that he would reline the hats now in possession of any of his customers and dealers. Incidentally we did Tony a disservice by unequivocally stating that the Machpi was officially banned. The ban was unofficial at the time and will undoubtedly not be made official due to Mr. Pompeo's immediate and eager cooperation in the effort to make competition safer for everybody.

Incidentally, it was gratifying to notice that not one single manufacturer complained at the way the test was made nor about the manner in which it was handled. In fact we have letters of congratulation from several of them. It all bears out what we said about these men being utterly sincere in their efforts to turn out a good, reputable product. Things like that are nice to know.

Very shortly we'll have another report on Dr. Snively's tests. Watch for it.

• • •

By now, everybody knows that the Corvette SS pictured on our centerspread was a no-show at Le Mans. This doesn't mean the car was a dud. Far from it; while the SS in both "Mule" and "show" variants ran they went like stink. The officially released lap time set by Fangio at Sebring in the prototype Mule was 3:27.2, a very respectable figure. Since then we have been in receipt of an interesting if unconfirmed piece of information which we'll pass on as rumor only since we cannot vouch for its accuracy. A gentleman we'll not identify called and said that he was in the official timers' booth while Fangio was running the SS. He swears he had an official clock on El Chueco and that the true time was a meaty three seconds less than announced! As we said, we can't prove this but we cannot disprove it either. Weight is lent to the claim in that several bystanders with very efficient looking watch sets also claimed at the time that they stopped their watches anywhere from 2.5 to three seconds before the announced figure. Could be; since no SCI staffer had a watch on that particular run you can take the above for what it's worth.

Meanwhile, for a really close look at what makes up this very fine automobile turn to the spread beginning on page 32 wherein the details are yours for the looking, including the only cutaway drawing of the car currently in existence.

• • •

Coming up next month are two items of interest. First, so you'll know what to look for we have reprinted our new look in titles on this page and elsewhere in the magazine. We have long thought our title or logotype was confusing on the news-stands, particularly where half of the magazine was hidden. It was embarrasingly like another magazine with a very similar title and they had it first. Further, the cover will show a painting of a car that has been trouncing everything else virtually since the day it was introduced some four years ago — the Lancia D-50, now known as the Ferrari-Lancia or, more officially, as the Ferrari D-50. With it goes a report by Karl Ludvigsen on how it came into being and how it has been developed each year. Don't miss it. —*john christy*

SPORTS CARS ILLUSTRATED

"move over"

It's another Lancia Aurelia convertible

Considered by most the world's fastest cornering automobile

The unique suspension of the new Italian Lancia, plus the ideal weight distribution, accounts for the phenomenal road holding qualities of this superb Italian automobile. Inboard brakes with clutch, transmission and differential housed at the rear, combined with piston type front independent suspension, guarantee a driving sensation you have never experienced before. A V-6 engine equipped with dual-throat Weber carburetors insures lightning quick acceleration plus effortless high speed cruising with a minimum of engine vibration that you can't be described. We suggest that you stop in to see your nearest Lancia dealer soon and ask for a test drive.

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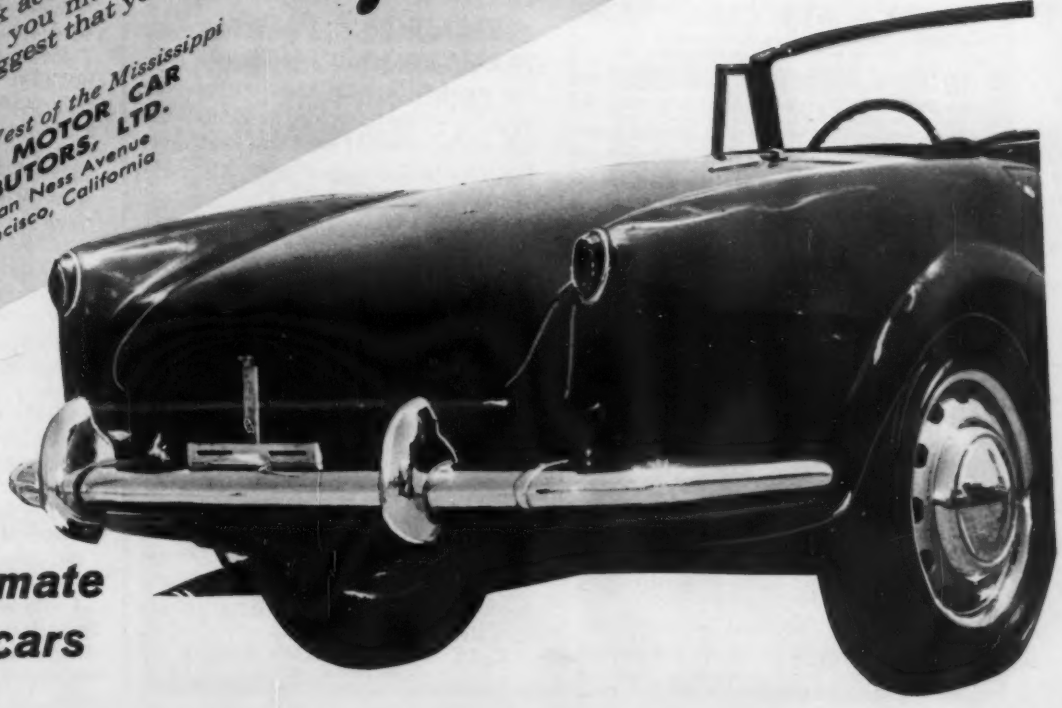


...the ultimate in sports cars

Devin Bodies

Many readers of *Sports Cars Illustrated* have expressed an interest in the Devin fibreglass body which was touched on in the story "Small Bore, Big Pull" (May SCI). Literally hundreds of letters and postcards have been received by Bill Devin all asking for details on construction, types of chassis to which the body can be fitted, etc., and for those who might like to learn a little more about the Devin body, here are some facts relative to it:

The Devin Fibreglass-plastic body is now available in nine sizes to fit chassis with wheelbases ranging from 78" to 94", tread from 40" to 52". The body has the same configuration and beautiful, functional lines in all sizes, but has been re-scaled in each instance to take advantage of the stock features of the chassis in various popular size ranges. In other words, the best performing and most available sports cars were carefully considered as possible bases for the bodies in each size. The 88" wheelbase TR, for example, takes a Devin body nicely with no modification to frame, running gear or mechanical components. Bill doesn't advocate that you throw away a perfectly good TR body, necessarily, but if you can find one with fairly extensive body damage at a reasonable price you can build yourself a featherweight sports car with one of the best looking bodies in the world for a figure that's easy on the pocketbook. Incidentally, shucking that TR body will drop many, many pounds off the 2,600 lbs. which most TR's scale. The Devin body weighs only about 100-150 lbs. You'll have a race machine with production-car reliability, as well as a genuine 'flat-out' look.

A couple of interesting cars are under construction at Bill's shop right now. One is an Austin Healey which was bought from an insurance company. The engine had caught fire and burned the car somewhat, but chassis, chrome wire wheels, rear end and steering were perfect. This is the kind of thing we're talking about. A young man paid a mere $150 for the works after the good parts of the body had been cannabalized. Devin has dropped the appropriate body right onto the chassis and the owner is installing a Chevrolet V8 where the hot four used to be. Moving it back in the frame for better handling was easy because many normal Healey goodies didn't have to be displaced and there is much room in the Devin body. Anyway, this lad will have a going piece of machinery at a fantastically low price when he gets through.

If you have a modicum of mechanical talent you can build yourself a street or competition machine using regular sports car frames and components. For instance, the little Volkswagens can be adapted simply and easily and slipped under one of the smaller Devin bodies...and it's not unusual to find a VW which has been rolled and crushed, and which can be had. The run of the mill Crosley, MG, Fiat, Hillman, Renault, etc., can be Devinized by you with good results.

For those who prefer larger equipment, Bill is now making a chassis, especially engineered for performance, using altered Ford parts. All the machine work has been done and the chassis (tubular frame, front and rear suspension and axles) is ready to receive any engine, including the late big OHV 8's, and the Devin Body. You bolt on wheels (with your own choice of brakes) steering (Ford Gemmer suggested) etc., all obtainable at low cost from used parts emporiums in your own home town.

Devin is also busy building competition cars. As most of you know, last year his cars were National champions in point standings in their classes, and he will design and build winning mounts in any division using your engine or providing everything. Prices by negotiation, of course. (For further information write to Bill Devin, Devin Enterprises, 44500 Sierra Hwy., Lancaster, California.)

Back to the body, note the clean lines of the car. The headrest is optional (r. or l.) and molded (lined) doors, cockpit liner with bucket seats, molded hood and deck lids and re-inforced hood and deck openings can be specified as well. All bodies are priced at $295 FOB Lancaster (includes crating, trimming and F.E.T.) or are available at more than 50 dealers in U.S. and aboard. Send $1.00 deposit to Bill Devin, Devin Enterprises, 44500 Sierra Hwy., Lancaster, Calif., for scaled drawings and full information on how to install the Devin body on the chassis of your choice. *This deposit will be returned with order.*

Write for name of nearest dealer in U. S., Hawaii or these countries: Peru, Puerto Rico, Mexico, Venezuela, British Columbia, Canada, Costa Rica, Luxembourg, Argentina, South Africa, Uruguay, South Viet-Namh, Portugal, Cuba.

letters

(Continued from page 5)

sible in New York State which, however, revoked this ruling known as "More Automobiles than Operators Ruling" as of that date. In other states the regulation still holds.

I would be glad to answer any other questions your readers may have. My address is 102 Maiden Lane, New York 5, N. Y. My telephone number: HAnover 2-6250.

Yours sincerely,
A. E. Goldschmidt

Mr. Goldschmidt is well known in racing circles—Ed.

talented mechanics

It was gratifying to see the talents of two very fine mechanics acknowledged in "More Push For The Porsche" (SCI, January 1957). Dale Reuter and Al Cecchel (shown holding a cylinder head in an illustration accompanying the article) rescued my tired 1951 Austin A-40 from oblivion earlier this year when I lived in Bakersfield. Their ministrations included head-milling, balancing, and sufficient tuning to somehow make an earnest TD-gobbler out of what had been a slug.

So let it be known that Porsches are not the only things these gentlemen can fix.

Very truly,
E. N. Story
Berkeley, California

to drool or not . . .

As a Bugatti owner allow me to correct a misapprehension in Ken Purdy's April SCI article on F. H. Ludington's Type 59. Some Bug fanatics have been known to drool at the sight of this car — me, for instance. Only thing is, I've learned to keep a straight face, gulp rapidly and swallow. This way, I won't leave a telltale spot on the floor to mar the good work of Messrs. Addams and Stein.

Best regards,
Dick Goldberg, Past President
Rolls Royce Owners Cub
Tuckahoe, New York

open class?

Your magazine Sports Cars Illustrated is terrific.

I write you because I have an idea that would give a lot of fellows like myself more incentive to build and to race our own cars. As it now stands amateur builders and drivers can run into some pretty stiff competition.

Suppose there was an event in races tailored to encourage ingenuity.

I suggest a $3,500.00 claiming race. Just like horse races. I suggest it be an open class, long distance event. Fender, fenderless, big or little engine. All regulations to

be for safety's sake.

I further suggest running on gas, no fuel.

What a colorful scramble this could be, but most important, what a wonderful incentive to build more for less, in the true American Spirit.

Sincerely,
John Tavian

The Canada Class (June '57) is an attempt to bring just such a situation about. It bears study.—ED

Could you please tell me how many MG-TA's there are in the United States? I am thinking very seriously of putting a '56 Chevy V8 in a 1937 MG-TA if it is not too scarce or too expensive.

Think SCI is the best on the market.

Yours truly,
R. Hunter Lewis
Box 4765, Tucker Dorm.
N. C. State College
Raleigh, N. C.

I frankly wouldn't advise this. The TA is virtually the same as the TC but with a smaller bore and larger stroke. The chassis is a bit whippy for the Chev and you'd run into serious gear problems as well. You'd be far better off using the TD which would probably cost less and which has a much sturdier chassis though not the classical good looks of the earlier series MG cars.—Ed.

I was very interested to read in your March issue in the article "Quick and Deadly", page 62, your remarks concerning the Swandean Spitfire Special. I hope you will not take it amiss if, as manufacturers of this car, I do slightly correct the facts as you present them. Firstly, at Brighton International Speed Trials I have used up to 4000 r.p.m. in the gears and reached within 2 seconds of the course record for the standing kilometre despite a shockingly slow gear shift (inherent in design). I would like to mention in view of your remark "is none too safe" that I do not know the source of your information but I have driven "Spitfire" at around 175 m.p.h. and she is the steadiest car I have ever driven at high speed. You may be interested to know that "Spitfire" is now in St. Louis where I understand her new owner is having a sports body shell fitted for road use!

Regarding the "Triangle Spitfire Special", this car was driven with great success by Ted Lloyd-Jones but it has always been known as the "Triangle Flying Saucer". It does not contain a Rolls-Royce Merlin engine as in "Spitfire" but a 21 litre unblown Rolls-Royce Kestrel of circa 1930. The "Flying Saucer" made fastest time of the day at Brighton and Ramsgate, our two premier sprints, in 1953 & 1954 and has not been raced since. I have now purchased this car and hope to drive it shortly.

Yours very truly,
F. M. Wilcock
Swandean Garage Ltd.
Arundel Rd., Durrington
Worthing, Sussex
England

TECHNOTES

By KARL LUDVIGSEN

C VALVES IN XK HEAD?

I'd like to modify a standard 1954 Jaguar engine enough to obtain 300 bhp on gasoline. To this end can you tell me if I can install 1⅝ inch exhaust and 1⅞ inch intake valves in a standard head? We want to obtain new seat inserts, jig bore the head properly and install the larger valves. We need dope on the seat composition, the amount of "meat" around the existing valve seats, and the method of fitting new seats.

James W. Graham
Indianapolis, Indiana

We're not certain that the big valves can be fitted to an early head with safety, since Jag probably had a good reason for fitting a new head casting to the C-Types. Judging by the amount of metal visible in the sawed heads we've looked at, though, it might be worth trying. The best approach to getting new valve seats would be a call to your dealer or a note to the factory. The stock inserts are centrifugally cast iron — not too special — while some of the competition versions use bronze inserts. We don't have specific dope on the installation of the latter, but following is info on the standard insert installation.

Once you've obtained the inserts, either factory or special, mike out their outside diameters. The ID of the new hole in the combustion chamber, with the head at 68 degrees F, should be .003 inch less. That's the amount of interference fit, and there's no taper. The old inserts can be removed by boring them out until they collapse. You can then check the depth of the bore and see if that dimension is suitable for the new insert. The .003 interference can be obtained by making the new bore .010 or .015 inch smaller than the miked OD of the new insert, and then grinding the latter down to exact size.

To get the inserts in, heat the head for one hour from cold in an oven at 450 degrees F. Cool the inserts also, if possible. This done, drop the inserts in and fit them as evenly and solidly as possible.

Now, to see if all is in order, insert a new valve of the type you intend to use and fit the camshaft, without *the tappet, etc. The distance from the valve stem end to the back, low side of the cam should be .320 inch* plus *the appropriate valve clearance. This includes .095-.097 inch for the valve adjustment shims. The allowable range here is .085-.103 inch. If the distance is larger than .320 plus clearance, grind the seat away. That's the way the factory wants it done, and you're free to take off from there.*

SEEKING PORSCHE PERFECTION

In the road test of the Porsche 1600 (June, 1956 SCI) it was pointed out that the shift control suffered from a long throw and excessive free play. Certainly those who race this fine car are not content with this condition. What's being done to remedy this deficiency?

Do you feel that negative camber on the rear wheels of a 1600S cabriolet would reduce its tail-wagging characteristic just a little? How much would you recommend? Do you know of any successful attempts to apply supercharging or fuel injection to the 1600S?

Robert J. Hatala
New Haven, Connecticut

While the Porsche shift linkage does draw condemnation from critical road testers and owners, its vagueness and long throw don't seem to be a handicap under racing conditions. The gearbox itself is still a tight, fast-working unit. You might, however, check those control links that are accessible through a plate at the center, just behind the front seats. Remember that much of the pleasing lightness of the Porsche shift is due to the high mechanical advantage given by the long lever and resulting spread-out shift pattern.

We find that the 1600 Porsches are much less "tail-happy" than the preceding models, and doubt that a change of camber is called for. You should try Pirelli or Michelin X (preferably the latter) tires on the rear wheels only, at first. Also try tire pressures at least five pounds higher in the back than in the front — except with the Michelins. Superchargers have been applied to Porsches, but at considerable trouble and expense. There's no kit available yet. We know of no fuel injection installations, which doesn't mean that a Hilborn rig couldn't be adapted to this engine.

MORE MODS FOR MG

Heedless of possible wrath from the gentlemen at Abingdon-on-Thames, I ask a few questions about improving performance of a 1952 TD. Is there any substitute gear made with a higher ratio than the unsuitably low 17.5/1 of first? I have in mind a ratio about halfway between stock first and second. I notice in your January, 1957 issue that the MGA has compact gauze-type air cleaners; are these adaptable to the TD? Would any performance be gained by the addition of a second electric fuel pump?

Finally, do you have any performance figures for the MG-Meyer Drake 1500 cc combination? I'd expect much better low-speed torque.

Bruce Cross
Northbrook, Illinois

As a side note I might mention that the MG men, far from resisting attempts to modify their cars, have gone so far as to issue an excellent step-by-step manual on that very subject for the XPAG engine. They may still be available from distributor or the factory.

Only thing I can suggest on your low gear situation is the use of a TC gearbox. Besides being ruggeder in design, this has high ratios throughout. Its low of 3.38 corresponds to your 3.49, which would be some improvement, and it will bolt right to your engine. Hellings Equipment long marketed compact mesh-type air cleaners for TC's and TD's. You should be able to obtain them through your local speed shop. Using your stock carb setup, no advantage would be gained by adding another fuel pump.

Back around 1952-3 both Bill Lloyd and Dave Michaels on the east coast were racing with TD's powered by 1700 cc ex-midget Offy engines. These perfomed well, but never really startled anyone. They were not street machines. The new chain-drive-cam 1500 Offy being developed by George Beavis promises to be more practical from both cost and maintenance standpoints. We'll have all the details for our readers soon.

SUPERHEATED JAG

I have a 1957 Jaguar MC Roadster that runs hot — between 85 and 90 degrees C. I've changed the thermostat to one that opens between 158 and 163 degrees F, but it still runs hot. I realize that these temperatures are not too serious, though normal should be 75 to 80 C, but I'm worried about the effects of warmer weather.

William Clark
No. Hollywood, Calif.

Jaguar has worked hard on getting these cars to run at a reasonable temperature, and should have it by now. Be sure your fuel/air ratio isn't too lean, and that ignition timing is right. To adjust your present thermostat further, unsolder the nut on its center spindle and unscrew it a couple of turns for a start. Resolder or otherwise lock it, and check the gauge level after running. Short of major ducting changes, this is the most you can do. If you can keep it around 85 degrees C. you're in fine shape.

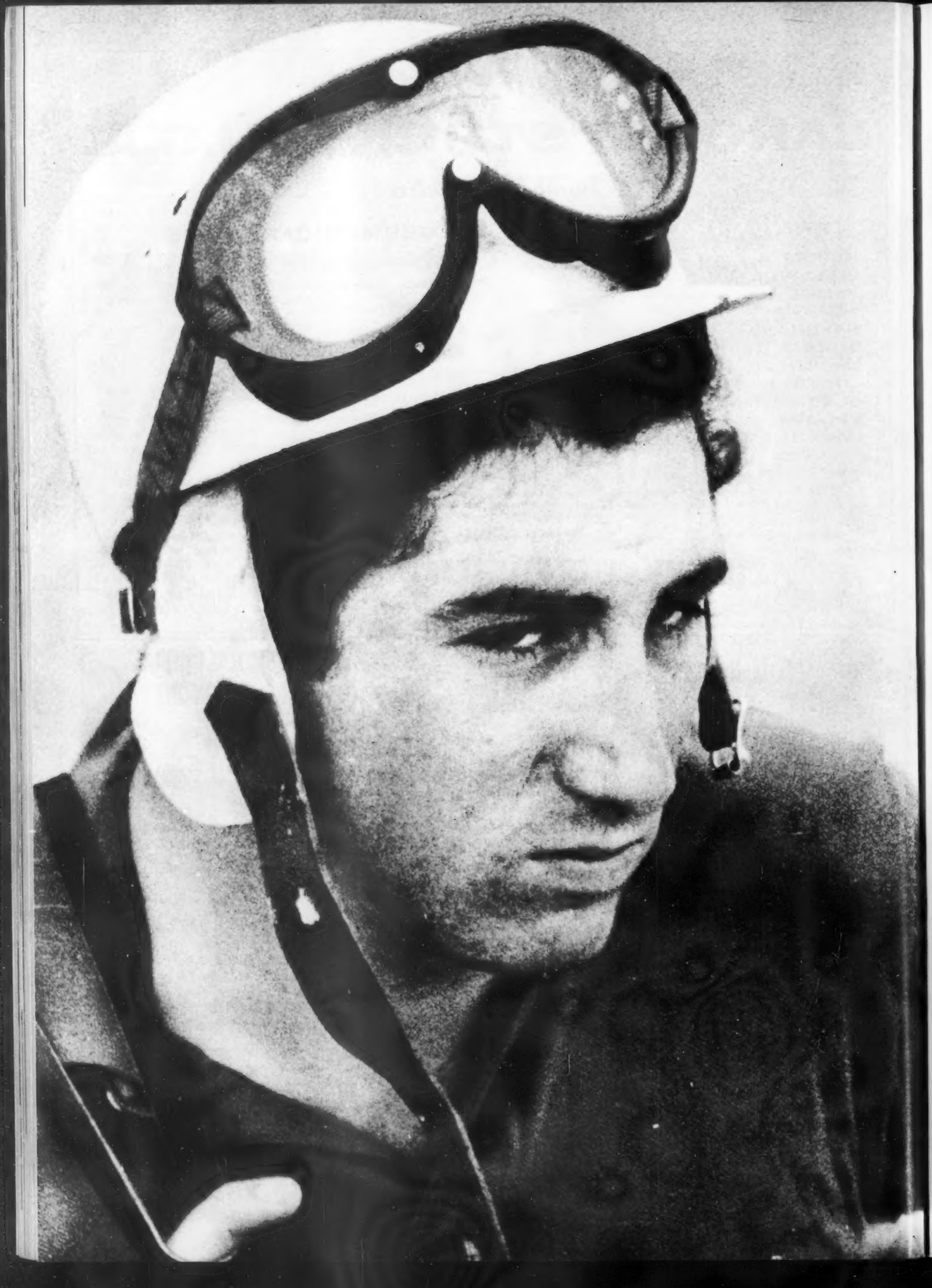
QUICKER CLUTCHING MGA

I'm having clutch trouble with my MGA and know several others with the same pains. It slips badly when making a shift at high rpm. I believe the new hydraulic control system is at fault and wonder if this can be replaced by a more conventional mechanical linkage. Can I use a new facing or heavier springs to correct the trouble?

Warren Davis
Princeton, N.J.

I know the problem but doubt that it's due to the hydraulic actuation system. This could only be at fault if the orifices in the system were so small that the fluid couldn't return from the clutch cylinder to the operating cylinder quickly enough. The clutch slippage lasts longer than this would. Anyway, the Ferrari/Lancia Grand Prix car squeaks by with such a system to work its rear-mounted clutch, so it can't be too unsound.

Springs seem to be the culprits, so you'll be glad to hear that the factory-stocked competition clutch assembly for the TD will fit the MGA. This includes heavier springs which should cure the slippage. You could also rebuild your present assembly to incorporate heavier coils.



Few men loved life as did Alfonso Cabeza de Vaca y Leighton and few were more often accused of wanting to leave it. The dean of American motoring writers tells the real story of the man known as

PORTAGO

By KEN W. PURDY

DON ALFONSO Cabeza de Vaca y Leighton, Carvajal y Are, Conde de la Mejorada, Marquis de Portago, was 28 when he died at Guidizzollo, a few miles from Brescia and the end of the Mille Miglia, on the 12th of last May. Portago had been a flier, a jai-alai player, a poloist, a steeplechase rider (the world's leading amateur in 1951 and 1952), an Olympic bobsledder and record-holder, a remarkable swimmer and he was at his death one of the dozen best racing drivers in the world. He had never sat in a racing car until 1954 but he believed he would be champion of the world before 1960 and most of the men he ran against every week thought that he very well might be—if he lived.

Certainly Portago was uniquely gifted. An athlete all his life, he was not a big man, not heavily muscled, but he had unusual strength, great endurance, abnormal eyesight, a quickness of reaction that was legendary among his friends. He was highly intelligent, courteous, and very much aware of the world around him.

Gregor Grant, editor of the British weekly AUTOSPORT, said just before the Mille Miglia, "A man like Portago appears only once in a generation, and it would probably be more accurate to say only once in a life-time. The fellow does *everything* fabulously well. Never mind the driving, the steeple-chasing, the bobsledding, the athletic side of things, never mind the being fluent in four languages. There are so many other aspects to the man: for example, I think he could be the best bridge player in the world if he cared to try, he could certainly be a great soldier, and I suspect he could be a fine writer."

Portago's death, I suppose, proved out again the two well-worn British aphorisms: "Motor-racing is a sport at which you get better and better until you get killed" and the other, less optimistic one, "There are two kinds of racing drivers: those who get killed before they get good, and those who get killed afterward." But whether they will die at the wheel sooner or later or not at all, most men have to serve years of apprentice time before they make the big league: the racing team of one of the major factories. They drive sports cars, stock and not-so-stock, in rallies and dreary airport events; they cadge rides in scruffy hand-me-down racing cars, hoping to attract a wealthy sponsor's eye. When—and if—they are invited to Italy or Germany or France or England to sign a racing contract, they have behind them thousands of miles of competition driven in dozens of makes of cars. This is standard, this is usual, and, with most of the other rules, Portago broke it. Driving relief in his first race, the 1,000 kilometers for sports cars at Buenos Aires in 1954, he did three laps so badly that he dropped the car from second place to fifth—because he had never learned how to shift gears! To the day he died, he had driven few makes of competition automobiles: Maserati, Osca, Ferrari. He never drove the usual sports cars, MG's, Jaguars, and so on. For personal use, before he began to compete, he usually drove American cars: Fords, something else that may have been a DeSoto, he wasn't sure. Explaining this, the last time I talked with him, he said, "Automobiles bore me, I know next to nothing about them, and I care less.

"I have no sentimental attachment for a car," he said. "I can hardly tell one from another. Sometimes I make a little scratch on a car, in an inconspicuous place, so I can recognize it the next time I'm in it, so I can remember its defects. I'm not interested in cars. To me they're a means of transportation from Point A to Point B, that, or a machine for racing.

"When I have a racing car that I'm going to drive, I walk up to it and I look at it and I think, 'Now, is this son-of-a-bitch going to hold together for the next 500 kilometers?' That's the only interest I have in it. And as soon as the race is over—I couldn't care less what happens to it.

"I think some drivers are not only indifferent to their cars, but hostile to them. They look at the car before a race and they think, 'Now, what is this thing going to do to me today, how is it going to let me down, or make me lose the race—or perhaps even kill me?'"

Portago's forthright disclaimer of interest in the machines on which his career was based was typical. To the outermost limits which custom and law allowed, the 12th Marquis de Portago said precisely what he pleased and did exactly what he liked. When he saw a girl friend in the crowd lining the streets at the Rome check-point in his last race, he stood on the brakes, locked everything up, waited for her, kissed her and held her in his arms until an official furiously waved him on. The girl, of course, was Linda Christian and Portago was probably the only man in the race who would have allowed himself such a gesture. He would have done it at the risk of his life. Portago was an avowed romantic, and he had remarked that in another age he would have been a Crusader, or a knight-errant. He often dressed in black, his hair was black and curly, usually long over his neck and ears, clinging to his head like a skull-cap, he moved quickly and rarely smiled, he sometimes looked like a juvenile delinquent or a hired killer, but more often like what he was, a Spanish grandee. The remark that he had been born three or four centuries too late was a cliche among his friends.

"Every time I look at Fon," one of them said, "I see him in a long black cape, a sword sticking out of it, a floppy black hat on his head, riding like a fiend across some castle draw-bridge."

When he began to drive Portago was not the best-loved figure on the international circuit—nor was he when he died, if it comes to that. Lacking the technical skill to balance his bitterly competitive instinct, he was dangerous in his first races, and to most people he seemed arrogant and supercilious. He was reputed to be enormously wealthy, he was a great lady-killer, and if he was not pugnacious still he was quick to fight. Most of the other drivers preferred to leave him alone. Nobody expected him to be around for very long in any case. Many thought he was just another aristocrat dilettante who would quickly lose interest in racing cars, but the few who knew his lineage were not so sure. His mother, an Englishwoman who brought a great fortune to his father, is a firm-minded woman, and a determined lust for adventure, plus an inclination for government, runs through the Portago line. Spanish history is studded with the name. In the 16th century one of Portago's forebears, Cabeza de Vaca, was shipwrecked on the Florida coast. He *walked* to Mexico City, recruiting an army as he went. Another conquered the Canary Islands, another was a leader in the fight to drive the Moors out of Spain. Portago's grandfather was governor of Madrid, his father was Spain's best golfer, polo-player, yachtsman; he was a fabulous gambler, said to have once won $2,000,000 at Monte Carlo, a soldier and a movie actor. He died of a heart attack on the polo field, playing against his doctor's orders. The last king of Spain, Alfonso XIII, was Portago's godfather and namesake.

Naturally enough, in the light of his background and his own propensity for high-risk sports, Portago was constantly accused of fearlessness, of clinging to a death-wish, and what-not. We talked at

Photo by Dan Rubin

Courtesy author from Portago

Even in his youth, Fon had the yen for competition. Here, after taking first prize in the 1935 horseshow at Biarritz.

"Not a smile, but a grimace of fear." This was Portago's own comment. First time down the St. Moritz run, he chopped fifteen seconds off the time of the Swiss champion.

Courtesy author from Portago

D. M. Bartley

Portago at Sebring in the 3.8 Ferrari, the car that "is against me." He drove ten hours out of the twelve, due to sudden illness of Luigi Musso. Musso fell ill again just before Mille Miglia and Portago had to take over the car.

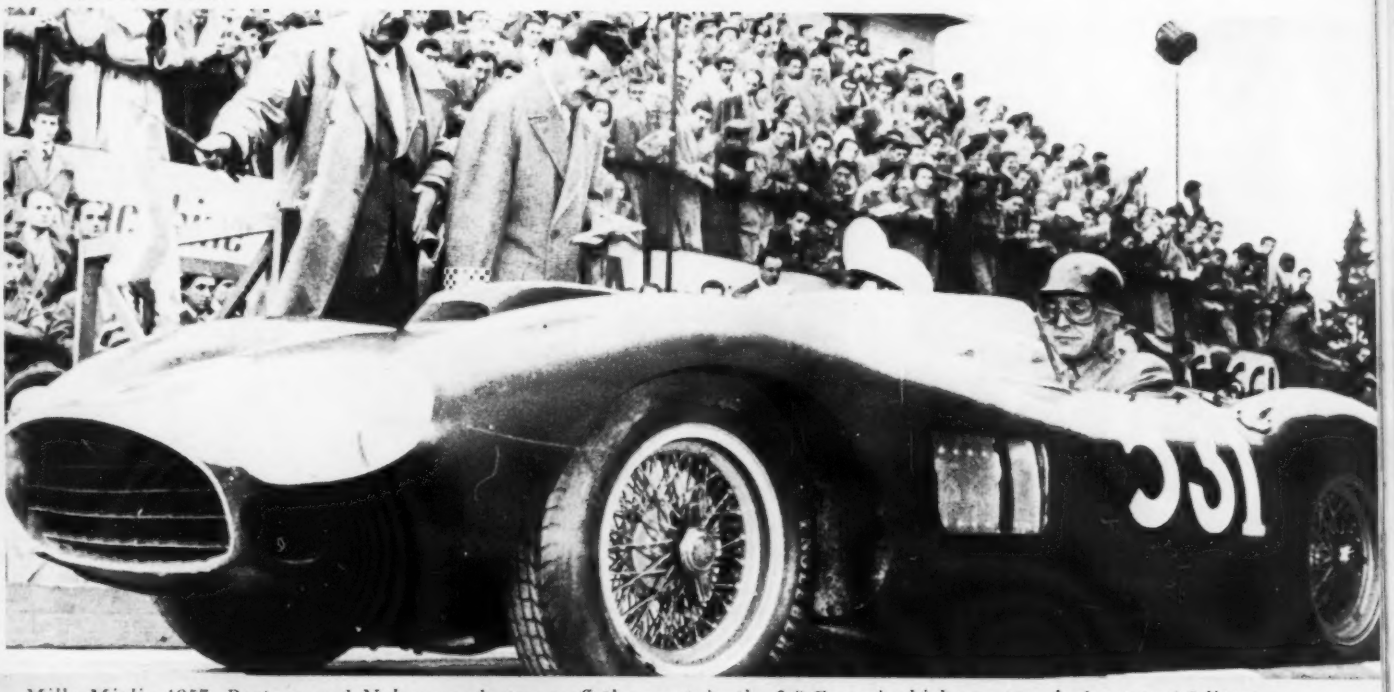
Photo by Dan Rubin

With Fangio. Portago had a keen sense, not only of his own driving ability, but of those competing with him. Placed himself among others behind Fangio and Moss.

Courtesy author from Portago

Harry Schell was Portago's first co-driver, his teacher and later his best friend.

Photos by Jesse Alexander



Mille Miglia 1957. Portago and Nelson ready to go off the ramp in the 3.8-Ferrari which was punched out to 4.0 liters. He hated this car and maintained that the car hated him. Actually, he had no desire to run in the Mille Miglia at all.

length about that, the last time I saw Portago. We sat in my room in the Kenilworth in Sebring. Portago had been very punctual, and had apologized for being unable to keep his promise that there would be no interruptions—he had placed a phone call to Caracas and he asked if he might tell the operator to put it on my wire when it came through. I wanted to record the interview and I asked him if he would object to a Minifon. He said he would not, and he told me about an interview recording he was making for Riverside Records, a house specializing in sports car material. We talked generalities for half an hour and then I turned the machine on. I mentioned a newspaper article that had said something to the effect that he "lived on fear."

"A lot of nonsense," Portago said. "I'm often frightened. I can get frightened crossing the street in heavy traffic. And I know I'm a moral coward. I can't even go into a shop to look around and walk out without buying something. As for enjoying fear, I don't think anybody enjoys fear, at least in my definition, which is a mental awareness of a danger to your body. You can enjoy courage—the performance of an act which frightens you—but not fear.

"I know that my first ride in a racing car frightened me. That was the Mexican road-race in 1953. I had been riding horses in competition for a long time, at least twice a week for two years, but I had to give it up because I put on some weight I couldn't get rid of. I couldn't get by no matter what I tried, and I tried most things: weighing-in with papier-mache boots and saddle, made to look like leather and weighing nothing, or hiding a five-pound weight on the scale so that the whole standard of weight for all the riders would go up!

"I met Harry Schell and Luigi Chinetti at the Paris auto show in 1953 and Chinetti asked me to be his co-driver in the Pan-American race. All he really wanted me for, of course, was ballast. I didn't drive a foot, not even from the garage to the starting line. I just sat there, white with fear, holding on to anything I thought looked sturdy enough. I knew that Chinetti was a very good driver, a specialist in long-distance races who was known to be conservative and careful, but the first time you're in a racing car you can't tell if the driver is conservative or a wild man, and I didn't see how Chinetti could get away with half of what he was doing. We broke down the second day of the race, but I had decided by then that this was what I wanted to do more than anything else, so I bought a three-liter Ferrari.

"I was fortunate, of course, in being able to buy my own car. I think it might have taken me five or six years longer to make the Ferrari team if I had had to look around for a sponsor and all that. I was lucky having enough money to buy my own car—even if I'm not 'enormously wealthy.' In those years I was perpetually in debt." (Portago earned perhaps $40,000 a year as a driver; he had various trust funds, but his mother controlled the family fortune which was of American origin and is reputedly very high in the millions.)

Harry Schell and Portago took the three-liter to the Argentine for the 1,000 kilometer sports-car race.

"Harry was so frightened that I would break the car he wouldn't teach me how to change gear, so when after 70 laps (the race was 101) he was tired and it was my turn to drive, after three laps, during which I lost so much time that we dropped from 2nd to 5th place, I saw Harry out in the middle of the track frantically waving a flag to make me come into the pits so that he could drive again. We eventually finished 2nd overall and 1st in our class. I didn't learn to change gears properly until the chief mechanic of Maserati took me out and spent an afternoon teaching me."

Schell and Portago ran the three-liter at Sebring in 1954. The rear axle went after two hours. He sold it and bought a two-liter Maserati, the gear-shifting lesson thrown in, and ran it in the 1954 Le Mans with Tomaso co-driving. They led the class until 5 in the morning, when the engine blew up. He won the Grand Prix of Metz with the Maserati—"but there were no good drivers in it"—and ran with Chiron in the 12 Hours of Rheims, Chiron blowing up the engine with 20 minutes to go while leading the class. He ran an Osca in the G.P. of Germany, and rolled it. "God protects the good, so I wasn't hurt."

In 1954 Portago broke down while leading the first lap of the Pan-American race in a three-liter Ferrari, and won a class, an overall and a handicap race in Nassau. He bent an automobile occasionally, and he was often off the road, but he was never hurt until the 1955 Silverstone when he missed a gear-shift and came out of the resulting crash with a double compound break in his left leg.

The crash had no effect on Portago's driving, he continued to run a little faster on the circuit and to leave it less frequently. At Caracas in 1955 he climbed up on Fangio until he was only 9 seconds behind him and finished second. He was a member of the Ferrari team in 1956, an incredibly short time after he had begun to race. He won the Grand Prix of Portugal in 1956, a wild go-round in which the lap record was broken 17 times, the last time by Portago. He won the Tour of France, the Coupes du Salon, Paris, the Grand Prix of Rome and was leading Moss and Fangio at Caracas when a broken gas line put him out of the race. After Caracas that year I asked Stirling Moss how he

(Continued on page 63)

SCI ROAD TEST: LANCIA

Owner demonstrates Spyder's speed and stability on test curve. At this point car is doing between 65-70 mph, remains flat. Michelin X tires helped Lancia stay glued with minimum tire squeal.

IT'S EASY to say without hesitation or reservation that this is one of the finest cars being built in the world today. Its excellence is total, as it should be: the "super-fine mechanism" is a deliberate, self-conscious work of art showing everywhere the touch of the fine Italian hands of Gianni Lancia, Vittoria Iano and Pinin Farina, each at his best.

The harshest criticism that can be made of this car, one you hear often from the unenlightened, is that "it doesn't *look* like that much money." But this is in the Lancia tradition of restrained good taste and clean, simple line. The only non-functional adornment on this body is a single chrome strip on each side, the deletion of which could improve its integrity as a sculptural form. The beauty of the body is subtle rather than spectacular and this is in harmony with the other aspects of this connoisseur's delight.

Under its skin the Aurelia is an engineering masterpiece and, again in the tradition of the house, the V-6 power plant, rear-axle transmission, and running gear are unique. Beyond that, each component performs its task perfectly and the finish is fine throughout. The car *is* spectacular for its engineering, roadability and impeccable finish. And this is where the money goes.

The first Aurelia G. T. two-seaters came to the U. S. in '55 and many detail improvements have been made since then. The originals did not have roll-up windows and their bumpers were on the skimpy side. These two shortcomings by U. S. standards have been corrected and E. Forbes-Robinson, purchaser of one of the first of the more luxurious "America" models, made it available to SCI for test as soon as he had clocked 2000 miles, including a couple of days' racing at Palm Springs. As he turned over the keys Robbie said, "Keep in mind that this machine wasn't designed to beat Ferraris. It's a high-quality road machine with respectable speed and dig. It's capable of sustaining higher than average road speeds because of an absolutely fantastic side-bite and perfect handling and brakes. Judge it as a road car, not a race car."

True, but the better Italian designers recognize very little difference in the two types; each has to stop, go, corner and brake excellently if it's to be a good car. When Jano designed the 2.3 Alfa-Romeo touring car in the early '30's it turned out to be a hard race car to beat and few changes were required to transform it into the P3 Monoposto. His Aurelia has a similar history. This conservative-looking touring car won its class in the '51 Mille Miglia ahead of two-liter Ferraris and was second overall, bested only by a Ferrari 4.1. Aurelias have scored literally countless racing successes since then, including a 1-2-3 in the Targa Florio and class win at Le Mans. And, as the old 2.3 Alfa engine was developed into one of the greatest racing power plants, the V6 of the Aurelia served as the basis for the engines of the all-

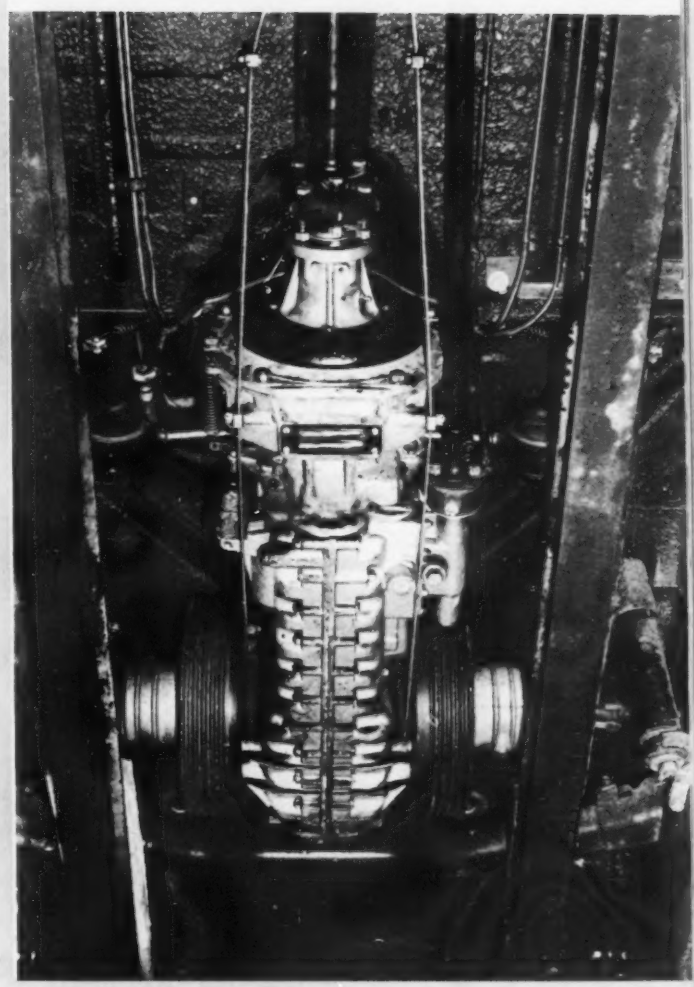
Chrome strip at bottom of door is only bright work on car. Body is steel in unit with frame. Hood and deck lid are aluminum, and free of drumming. Fuel tank is set aft of seats making luggage compartment roomy.

out competition cars that won the '53 Panamericana 1-2-3 and were later taken over by Ferrari. So the standard Aurelia is a good deal more than "just a road machine" and has much in common with the designed-from-scratch race car.

You open the rather shallow door and step far down to the floor-panel. The seats are deeply padded, covered with soft, pleated leather, and have a wide range of adjustment both fore and aft and of rake of the seat back. The steering wheel is a jewel of machined aluminum with a thin hardwood rim and it's adjustable. The starter is activated by pressing the ignition key and the engine fires readily. In place of an automatic choke there is a manual control, a lever that hangs just behind and below the instrument panel. Beside it is a similar hand-throttle lever. When the choke is opened even slightly a red warning light burns on the tachometer face. The engine idles at about 800 rpm with absolutely no rocking on its four-point rubber mounting, with barely a sound and no vibration. With a hand on a rocker cover you can run the engine up to its 5300-rpm red line and still feel no vibration.

The big, rigid steel-tube shift lever is typically Italian. The shift pattern is standard "H" with reverse off at the lower right, making downshifts to second foolproof. The "H" is very narrow and the lever is rather heavily spring-loaded to keep it on the 3-4 side, and this takes a small amount of getting used to. The clutch operates with moderate but not light pressure. First can be engaged at standstill without clashing gear teeth and is easy to double-kick down to. The lever can be sliced through the three synchro gears like the proverbial hot knife through butter, even though the gearbox is in unit with the rear axle.

Getting under way, even during acceleration tests, we experienced no wheelspin, thanks partly to the semi-independent rear suspension and partly to the effect of three elastic couplings in the two-piece drive shaft. Even first gear is extremely quiet and the only noise even slightly noticeable is a smooth audible whirr from the engine that becomes audible at around 3000 rpm. The mufflers silence the exhaust completely as far as the occupants of the car are concerned and this, plus the smoothness of the engine and almost total insulation against road shock, gives an impression at 100 mph of floating along at 25 in a turbine-powered vehicle. The Aurelia's ride is a remarkable thing that somehow com-



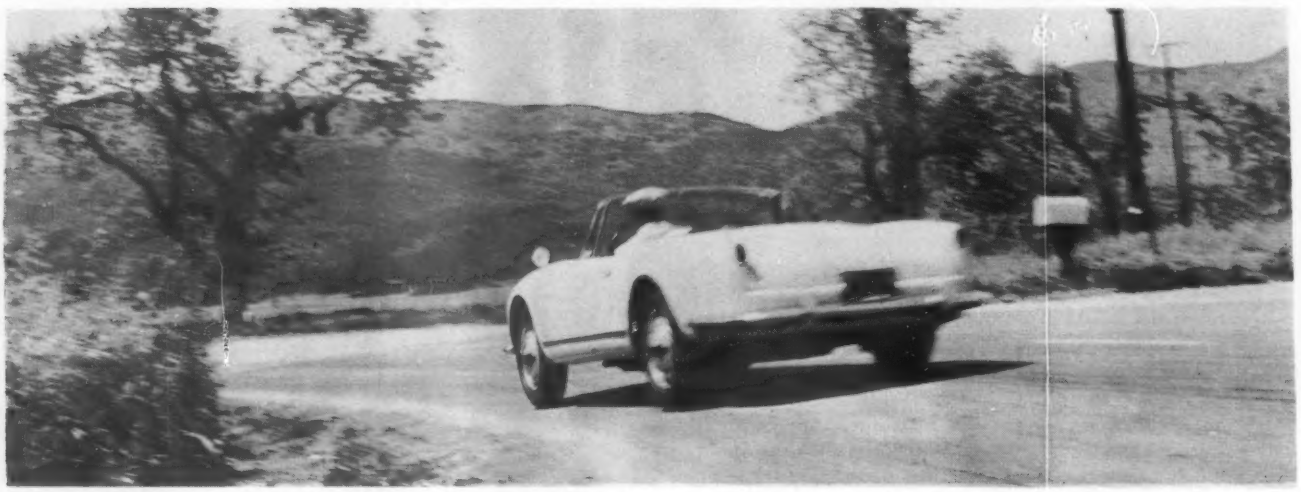
Driveshaft connects to clutch housing through elastic coupling. Four-speed transmission, final drive are one unit. Large inboard brake drums straddle rear drive. "Propulsion unit" mounted on body-frame, insulated by rubber blocks. Springing is by semi- elliptics.

Rear wheel with lug wrench, hub cap and special wrench, and outer U-joint cover which is retained by large nuts. To keep friction losses low, and extend life of joint, Lancia locates external U-joints outside of the wheels. Greater length of half-shafts reduces angular deflections in joints.

bines the best of Detroit-creampuff with race car flatness and firmness. It's simultaneously a luxury ride and a competition ride.

When I first took the Aurelia over the familiar turns of the test course I immediately assumed that its speedometer was something like 10 mph fast. It had to be, I thought, because awfully fast speeds were being indicated yet there was not a trace of tire squeal, the body stayed dead flat and each maneuver was completely effortless – as effortless as tooling along in a straight line. Then we calibrated the speedometer and found it to be very close to the facts. Forbes-Robinson, who knows what his car will do on a race course as well as on the open road, expresses its handling like this:

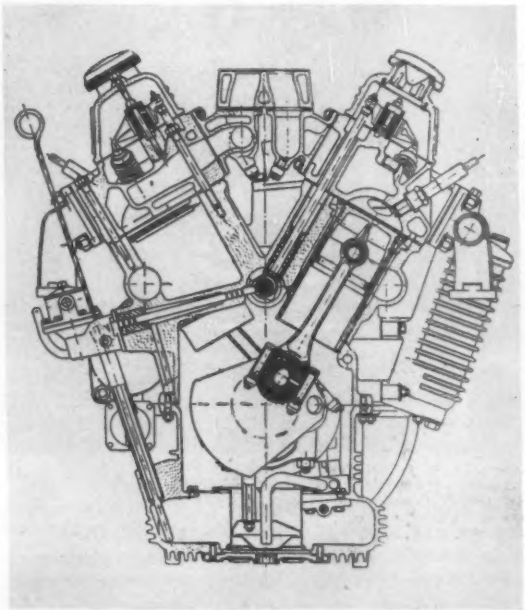
"Here's a car that handles so well that the average Sunday



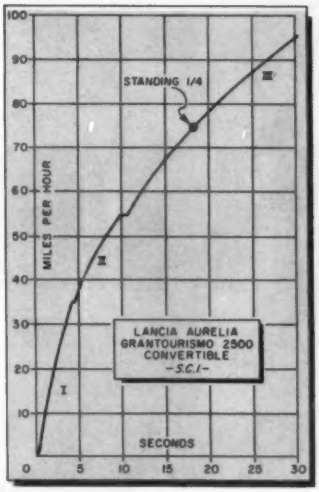
Cornering hard through test bend, Spyder leaves traces of rubber. This "stage three" cornering at speed produces 4 wheel drift.

driver can stick it into a turn well over the normal correction speed and yet still be *driving* the Lancia. You can go around a corner on rails where the average car is in a slide; how they've engineered it I don't know, but it's there, all right. I call the "on rails" range Stage One. The instant you get over that in the Lancia it starts to mush the front end just a tiny bit. All you have to do then to get back in your lane is to back off slightly on the throttle. That's Stage Two and it's simple even for the novice to handle. There's a third stage beyond that but you have to be going awfully fast to reach it. You get into a turn at this speed, cock the front end and the back end starts to go and then all four wheels drift sideways. This is perfectly controllable but it gets a bit tricky and exciting up there. This technique should only be used under the relatively safe and predictable conditions of a race course and the driver that tries it had better know what he's doing."

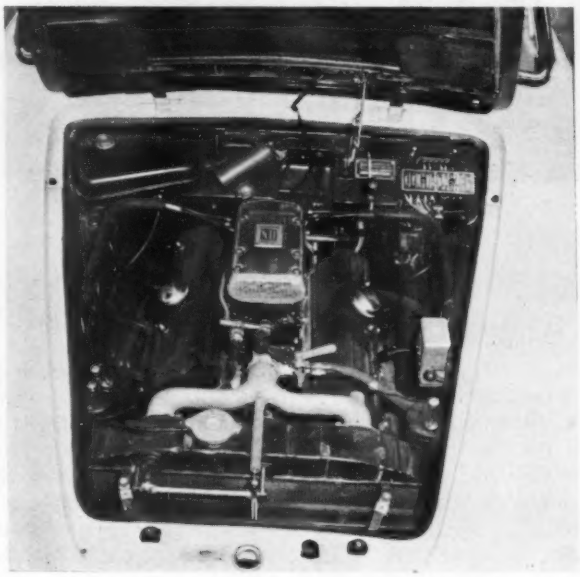
Lake Jano's classic Alfas, the Aurelia uses worm and wheel



Front view cutaway of the unique V-6 engine. Block, sump, and cylinder heads are light alloy. Engine weighs only 353 pounds.



Engine compartment is small, cramped. Mill itself is mounted at four points on rubber blocks, is vibration-free. "America" model is equipped with Nardi manifold, two dual-throat downdraft Weber carbs.



steering and like the Alfas, it seems to steer itself around corners. Its 3¾ turns from lock to lock may sound slow but very small wheel movements are required. The steering is as feathery as the power-assist kind, the feel is very light and there is almost no caster action, at least as Robbie's car was set up. The steering is reversible to some extent and road shocks are transmitted back to the wheel – a small price to pay for this exceptional steering.

The Aurelia's brakes are superb and have a far greater ratio of friction area to car weight than those of any touring vehicle we have tested. The front brakes are cooled by means of large air scoops in the backing plates while the inboard rear brakes sit right in the air stream. These binders are without vices. They do not pull to the side nor lock up and the front end does not dip. Aside from a slight loss of effi-

(Continued on page 48)

LANCIA AURELIA GRAN TURISMO 2500 CONVERTIBLE.
Also called "America" model.

PERFORMANCE

TOP SPEED:

Two-way average	108.8 mph.
Fastest one-way run	110.1 mph.

ACCELERATION:

From zero to	Seconds
30 mph.	3.9
40 mph.	5.5
50 mph.	8.4
60 mph.	12.4
70 mph.	16.3
80 mph.	21.0
90 mph.	27.1
100 mph.	35.0
Standing ¼ mile	18.3
Speed at end of quarter	74.8 mph.

SPEED RANGES IN GEARS:

(1) I	zero to 35 mph.
II	7 to 55 mph.
III	11 to 80 mph.
IV	14 to max.

SPEEDOMETER CORRECTION:

Indicated	Actual
30	28
40	38
50	47
60	57
70	66
80	77
90	88
100	100

FUEL CONSUMPTION:

Hard driving	15.3 mpg. during speed & acceleration tests.
Average driving (under 60 mph.)	21 mpg. plus

BRAKING EFFICIENCY (10 successive emergency stops from 60 mph, just short of locking wheels):

	per cent
1st stop	70
2nd	79
3rd	64 — no further fade.

SPECIFICATIONS

POWER UNIT:

Type	V6-60°
Valve Arrangement	vee-inclined, pushrod
Bore & Stroke (Engl. & Met.)	3.06 x 3.36 ins.; 78 x 85.5 mm.
Bore/Stroke Ratio	1.10
Displacement (Engl. & Met.)	149.6 cu. ins.; 2451 cc.
Compression Ratio	8.4 to one.
Carburetion by	Dual two-throat Weber downdrafts.
Max. bhp. @ rpm.	130 @ 5300
Max. Torque @ rpm.	137 lbs. ft. @ 3500
Idle Speed	700-800 rpm.

DRIVE TRAIN:

Transmission ratios I	3.093
II	2.058
III	1.415
IV	1.000
Final drive ratio (test car)	3.73 Gleason Hypoid
Other available final drive ratio	—
Axle torque taken by	De Dion tube and body-frame.

CHASSIS:

Wheelbase	96.5 ins.
Front Tread	50.4 ins.
Rear Tread	51.2 ins.
Suspension, front	Lancia sliding pillar; beam axle and coil springs.
Suspension, rear	De Dion with semi-elliptic springs.
Shock absorbers	Telescopic, adjustable at front.
Steering type	Worm and wheel.
Steering wheel turns L to L	3¾
Turning diameter	32 ft. 10 ins.
Brake type	2 leading shoe F; one leading, one trailing at rear.
Brake lining area	300 sq. ins.
Tire size	550 x 16/165 x 400.

GENERAL:

Length	166.5 ins.
Width	61.25 ins.
Height	46 ins. to top of windshield; 50 ins. with top up.
Weight, test car	2760 lbs.
Weight distribution, F/R	46/54
Fuel capacity—U. S. gallons	15.8, incl. 2-gal. reserve.

RATING FACTORS:

Bhp. per sq. in.	.87
Bhp. per sq. in. piston area	2.95
Torque (lb-ft) per cu. in.	.92
Pounds per bhp. — test car	21.2
Piston speed @ 60 mph.	1663 fpm.
Piston speed @ max. bhp.	2968 fpm.
Brake lining area per ton (test car)	217.4 sq. ins.

GALE

A simple bolt-on kit can make Ford's Zephyr go like its big brothers from Detroit. All this and economy too - what more can you ask?

Mays-treated test car differed from standard Mays setup by having the larger (2H6) carbs delivering 11 hp extra. Stock R.M. layout uses SU (2H4) carbs.

By DENNIS MAY

KEN WHARTON's last race in his native land, before crashing fatally at the wheel of a Ferrari at Ardmore, New Zealand, early in January, made a sharp impression on intellects that don't impress too easily. This was a ten lap event for stock and modified sedans over the weavey Oulton Park circuit, 2¾ miles around, in Cheshire, England. Wharton, vacationing from the FI and sports-racing cars that had latterly occupied most of his time, drove a Ford Zephyr and won any way he liked. *Autocar* described the Zep as "incredibly fast . . . and very stable," *Autosport* adding that it "handled and sounded like a Formula I car."

Wharton's race average was 69.44 mph, which, considering nobody gave him a run for his money, compared favorably with Ivor Bueb's 74.39 per in the concurrent *Gran Turismo* contest on the fastest 300SL Merc in the country.

This, of course, couldn't be any ordinary Zephyr, and it wasn't. One clue to its Q-ship character was that Formula I dialect noted by *Autosport*. Another, viewing it from astern, was its dual exhaust system. Otherwise, unless you lifted the lid, Ken's car was indistinguishable from the commonalty of Zephyrs issued by Ford's English plant at Dagenham, Essex.

Source of the extra virility was an engine makeover designed and developed by the technical associates of Raymond Mays, the veteran race driver, and made and marketed by Rubery Owen and Co., Ltd., of Bourne, Lincolnshire, England. For *SCI*'s public, the facts of this pack's parentage are significant insofar as Rubery Owen are now on the scent for U. S. dealerships. By the time this issue is on sale it's probable that the Raymond Mays conversion, as it is called, will be available to U. S. owners of the mechanically identical Zephyr and Zodiac sixes from domestic sources.

But before playing over this variation on the Ford engine theme we'd better take time for a brief rendition of the theme itself. This unit, then, is a pushrod ohv six with more bore than stroke—3.25 by 3.125 inches—and a displacement of 155.8 cu. in., i.e., a mite over 2½ litres. The crankcase-cum-cylinder caicase is an iron casting, and so is the detachable head. The valves are in line but inclined at 14 deg. to the vertical. Inlet and exhaust ports, the former siamised and the latter separate, are both on the left side of the head. Carburetion is by a single downdraft Zenith 34WIA and spent gas makes a rather uneasy exit into an exhaust pipe pierced with holes corresponding to the ports and clamped directly to the head (there is no manifold in the ordinary sense). The crankshaft is cast iron and runs in five bearings; journal and crankpin diameters are 2⅜ and 2 inches respectively.

With the standard compression ratio of 7.8 to 1, this powerplant develops 86 horsepower at 4200 rpm and a maximum torque of 136 lb/ft at 2000 per minute.

Kernel of the R.M. conversion is an aluminum alloy cylinder head in a material known as DTD424, the same metal that Jaguar used on all the XK variants and derivatives. Except insofar as the depth of the wedge shaped combustion chambers is reduced to give a higher compression ratio, the interior form of this head is similar to Ford's own; direction of squish is towards the 14 millimeter spark plugs, which are on the remote side from the ports and set at a slightly downward slant. The porting, however, breaks right away from Dagenham's design. Inlet tracts have a semidowndraft inclination of 45 degrees, and this, in conjunction with valves at the decreased angle of 4 deg. to the perpendicular, makes for very free flowing passages.

The inlet manifold too is an alloy casting and mounts dual SU carburetors at a slope that continues the line of the ports. The manifold has a center dividing wall with a connecting drillway to balance the ration of charge between the two groups of cylinders.

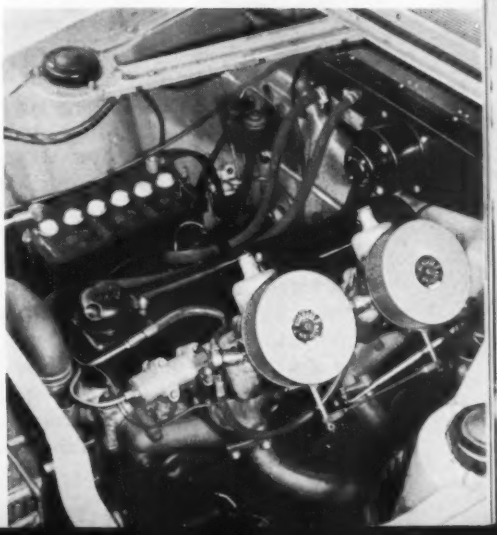
In the offtake department, Ford's rudimentary plumbing

(Continued on page 48)

FORCE FOR THE ZEPHYR

Visibility from Zephyr's driving seat is equal to current Detroit standard, better than British. Wheel angle is restful, gives good control at high speed.

Wide compartment gives good accessibility to plugs, valve gear etc. Kit is slated to be marketed here in very near future.



Kit includes high compression, aluminum alloy head, dual semidowndraft SU carbs, header system, oversize valves, tube push rods.

FORD ZEPHYR WITH RAYMOND MAYS CONVERSION

PERFORMANCE

TOP SPEED:

	R. M. Conversion	Stock
Two-way average	102.2 mph	86.0
Fastest one-way run	103.4 mph	—

ACCELERATION:

From zero to	R. M. Conversion	Stock
30 mph	4.0 secs.	—
40 mph	5.1 secs.	—
50 mph	8.6 secs.	12.3
60 mph	10.3 secs.	17.9
70 mph	15.0 secs.	25.4
80 mph	19.4 secs.	35.8
90 mph	23.3 secs.	—
	R. M. Conversion	Stock
Standing ¼ mile	18.4 secs.	20.5 secs.
Speed at end of quarter	78 mph	63 mph

SPEED RANGES IN GEARS:

I	0 to 32 mph
II	7 to 60 mph
III	10 to 103.4 mph

SPEEDOMETER CORRECTION:

Indicated	Actual
30	27
40	36
50	46
60	55
70	67
80	75
90	85
100	95

FUEL CONSUMPTION:

Hard driving	15.8 miles per U.S. gallon
Average driving (under 60 mph)	See text.

BRAKING EFFICIENCY:

(10 successive emergency stops from 60 mph, just short of locking wheels.)

1st stop	70
2nd stop	71
3rd stop	72
4th stop	71
5th stop	70
6th stop	69
7th stop	64
8th stop	64
9th stop	66
10th stop	65

WHENCE COME THE HORSES?

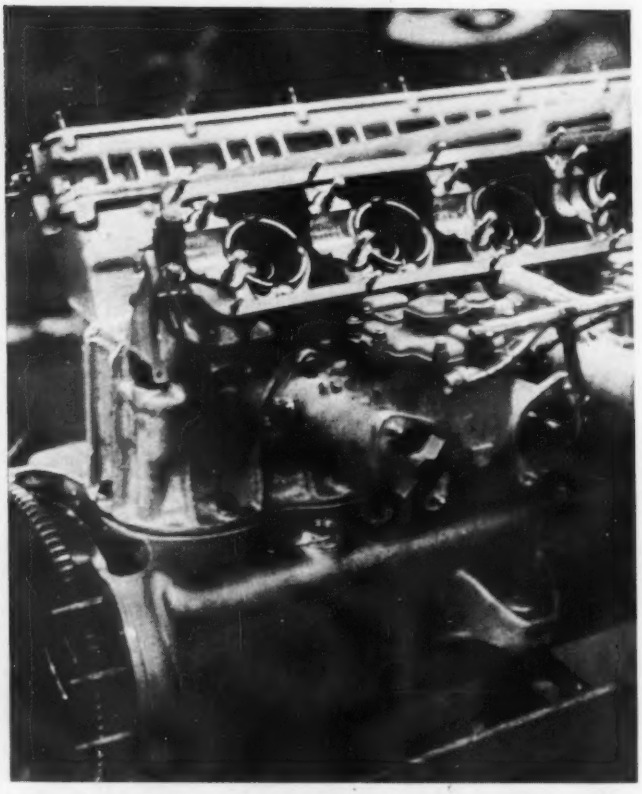
By KARL LUDVIGSEN

THE prototype Mercedes M196 engine was first run with normal carburetion (Webers). Surprisingly, moreover, halfway through their second postwar racing season Mercedes' Engineer Lamm remarked that carburetors *might still be better* than fuel injection for some courses. In detail, he felt that injection was a big help at low speeds and didn't harm top end output. From this and from the results in late 1954 we can guess that from their standpoint carbs might have been an asset on the *faster* European courses.

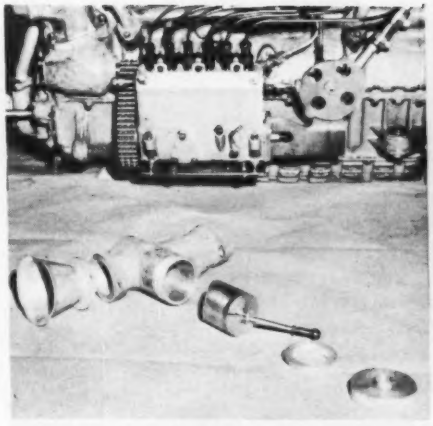
This is pretty startling in itself, and even odder when related to the unhappy struggles of other GP designers to equip their machines with fuel injection. One characteristic story is that of England's Connaught cars, for which Mike Oliver has carried out an extensive and intelligent engine development program. Financial problems, though, have kept him from holding the needle at the peg both long and hard on the dyno.

In 1952 Connaught rocked all the pundits by clamping Hilborn injection on their Lea-Francis-based Formula II engines, which had been burning alcohol since the previous year in contrast to the "petrol/benzol" mixtures then common. They'd been using four of those cranky Amals before, and they liked the easy mixture adjustment afforded by the simple constant-flow Hilborn system. At that time it was a good deal, but when they moved up to the 1954 2.5 liter formula, Connaught picked the Alta four-barrel and the much more complex SU timed-injection equipment. This injection has a comprehensive speed-density metering system, but in '54 tests they couldn't calibrate it properly for the Alta (which was nevertheless giving 240 horses at 6400), and reverted to the more familiar Hilborn gasworks. Both these layouts inject fuel in the *port*, the SU nozzle attempting to spray past the valve into the cylinder.

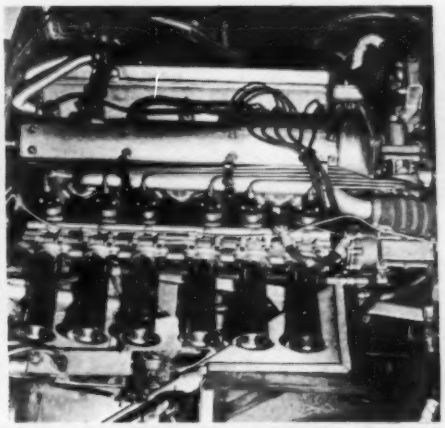
California honor was upheld until August, 1955, when Connaughts converted some pounds to lire and came home with the 48mm twin-choke Weber carbs mentioned earlier.



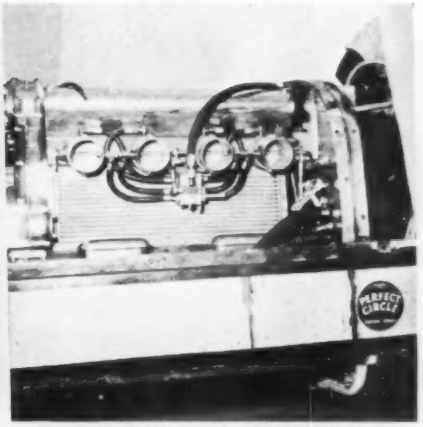
The 4.4 Ferrari engine was fine for sports car racing, but poor porting design proved to be a handicap at Indy. Hilborn injection might have been the answer had they used the right fuel pump.



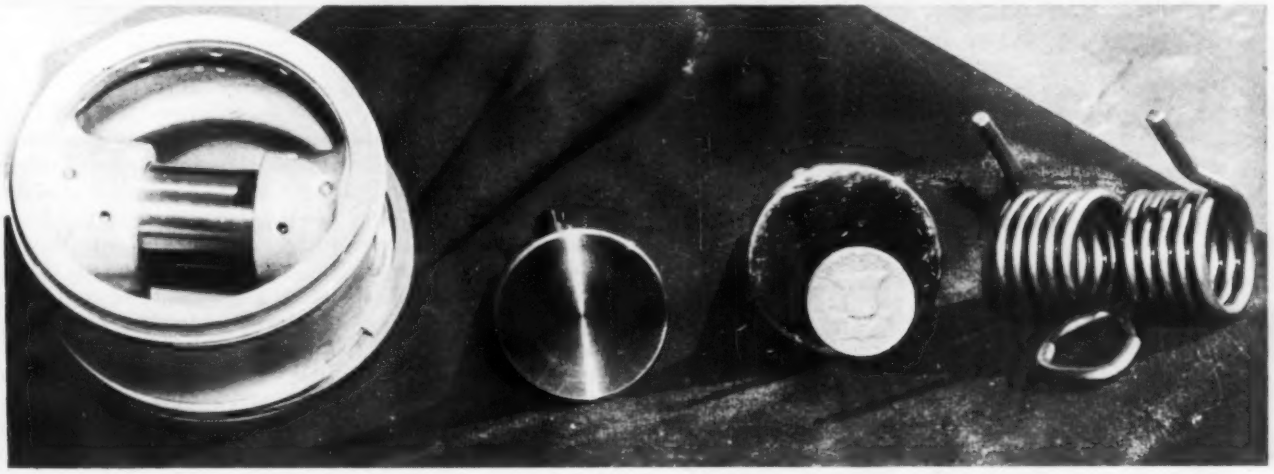
Maserati finally decided on vertical slide throttle which has the advantage of being fully out of the way at full noise.



Jaguar's Lucas injector has single horizontal slide throttle plate for all ports. The effect is the same as that on Maserati — no butterfly shaft.



The big 270 Offy is pushing 400 bhp almost, thanks to Hilborn injection and the biggest ports in the field. Four valves per cylinder are used.



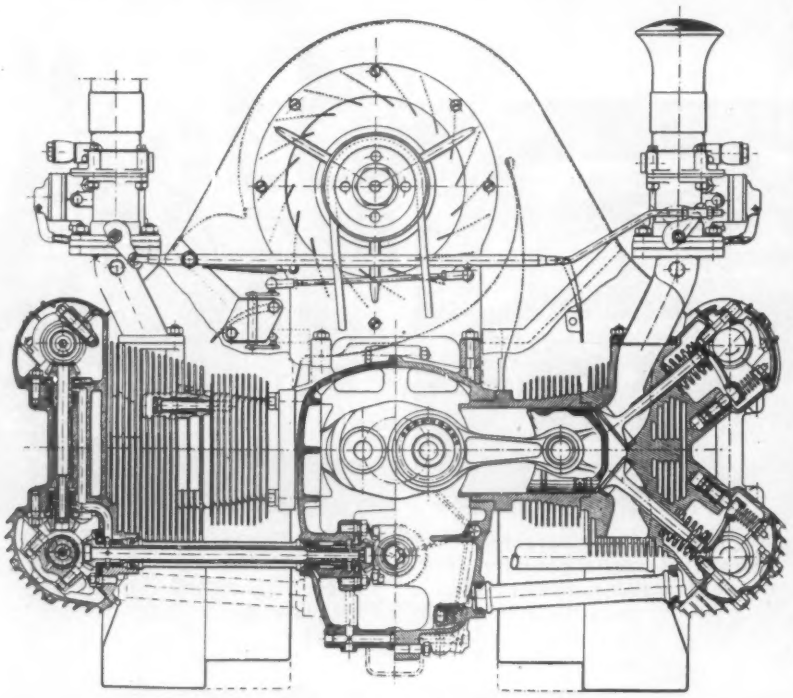
Components of 3.5 Ferrari are marked by huge piston pin and enormous size valves. Intake valve is compared to half dollar. At right is extra heavy tensioned valve spring of hairpin or mousetrap design.

Only then did the car show the speed that it needed to wipe up the full Maserati team at Syracuse two months later. It had always been easy enough to set the injection systems for maximum power, but neither setup could fill in the middle and lower sections of the torque curve.

Similar agonies are being endured in the Maserati camp, which is split wide open over the issue of fuel injection. Pioneering work was actually done by Alf Francis on the 250/FI Grand Prix car owned by Stirling Moss Ltd., which was fitted with the SU system in the spring of 1955. On the bench in England and breathing through 42mm Webers, Moss' engine gave 215 horses with 50 percent methanol. The same fuel mixture squirted through the SU nozzles gave a peak of 232 bhp, and 80 percent methanol injected produced 253, but *both* injected curves were well below the carbureted figures over the important range from 4500 to 6000 revolutions. Naturally enough the Webers went back on for the short English sprint races, and the same problems have cropped up on the works-injected Maseratis.

Due to their metering requirements, most SU installations (including those above) draw air through a single big throttle valve into a collector box which supplies the tuned lengths to the cylinders. Exceptions are the early Alta test-bed setup and the Turner 2-liter, which carry separate throttles for each of their four cylinders. Turners say that this gives them more precise control. Whatever the justification, the factory-injected Maseratis, Vanwalls and D-Jaguars have a tuned intake and a vertical or horizontal slide throttle for each cylinder. The first two use modified Bosch pumps, while Jaguars have been the first to benefit from the much-improved Lucas injection.

Maseratis have tried both pivoted and vertical-slide throttles, finally settling on the latter which has the big advantage of being fully out of the way on full bore. For the first half-year they injected in the port above the valve, and only after the Belgian GP of 1956 did they use the Bosch-type O.M. pump to the full and inject directly from a point just below the exhaust valve, the diametrical opposite of Mercedes placing. A triple roller chain drives the pump, and its metering rack is controlled by a cam rotated by the main throttle rod. Even now it's still a highly experimental rig, and has yet to be trusted in a *Grand Epreuve*. Injected output has improved under development from 270 to 285 horses, which isn't a big margin over the Webered engines, and like Moss' trials the low-speed torque and response are actually worse, as is fuel consumption. They're going to

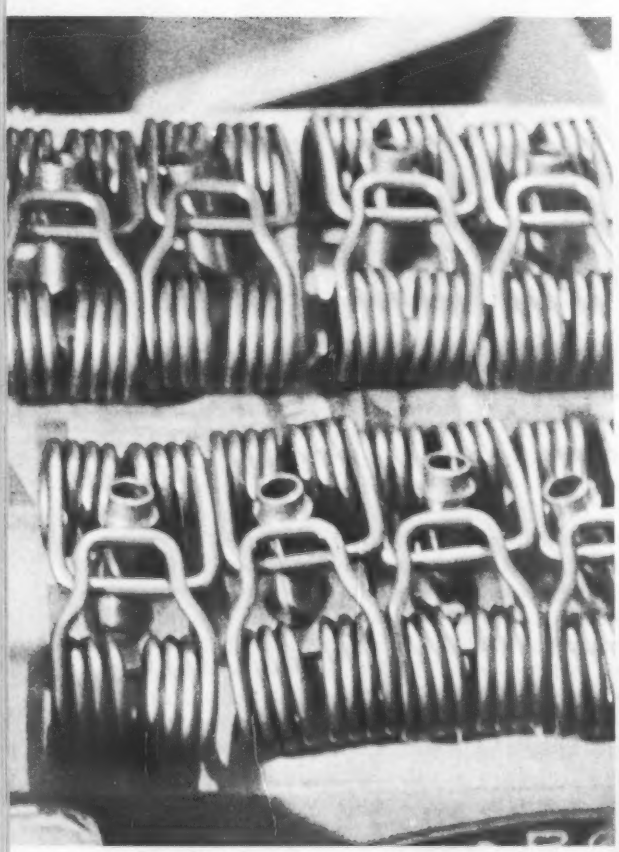


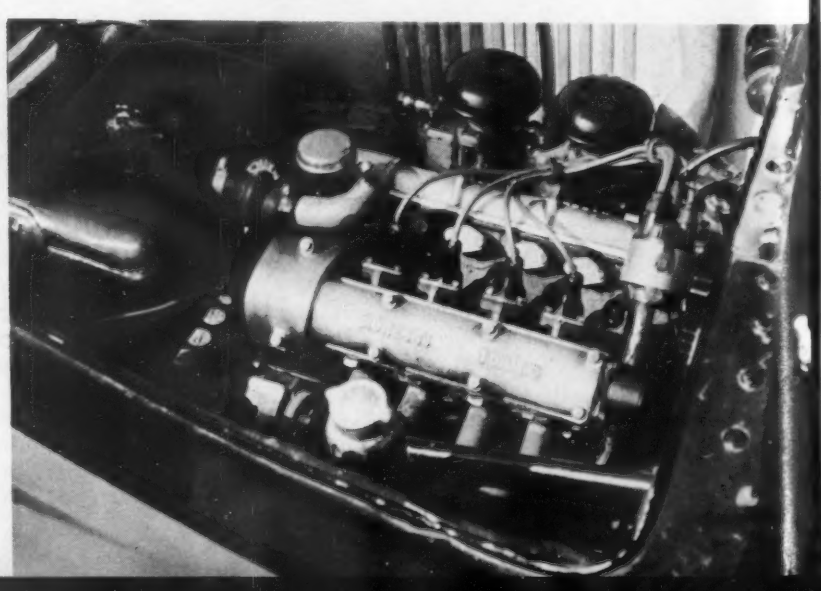
Very light valve train and good straight-through porting mark the Porsche 550 engine. Only 91 cubic inches, it consistently outperforms and outlasts bigger machinery. Further improvements within the design limits are entirely possible. Such things as direct fuel injection and desmodromic valve gear are well within the realm of reason here and could further increase the already respectable 140 bhp given by latest model.

Bosch equipment in 1957.

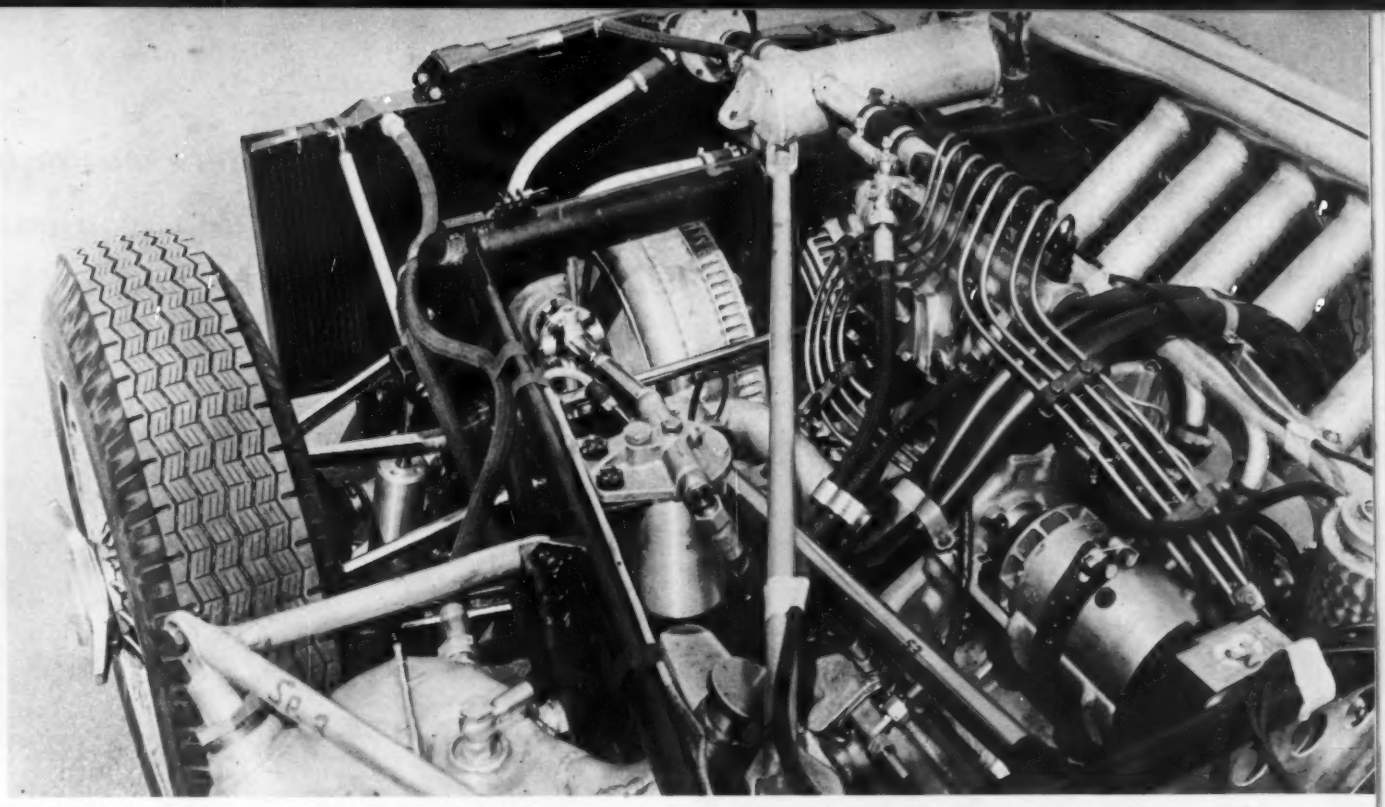
A Bosch pump, vertical slides and separate intakes are found on the Vanwall. Amal carburetor bodies (without venturis) supply the throttles, and the nozzles are placed in the ports very close to the intake valves. Once set, this layout was extensively tested under the supervision of an ex-Norton designer, and they now claim 292 horses at 9000 for this interesting four-cylinder, which would qualify it as the best injected GP engine now running. Problem now is to make the rest of the engine stand up to this power, which may prove embarrassing to bearing manufacturer Tony Vandervell.

Sebring was an impressive debut for the Lucas-injected works D-Type Jag, and since that time it's proved to have the same characteristics as the Connaught and Maserati attempts: Faster than standard on fast courses and inferior on slower tracks. They've produced a ridiculously simple horizontal slide throttle, which is little more than a single strip with six holes punched in it. As a result of several years' bench testing by Lucas, their nozzles are placed in the intake ports a couple of inches from the valves and make no attempt to spray directly into the combustion chambers.





ABOVE: Much like torsion bar valve springs, these mousetrap springs are free of heavy surge periods, and two can be installed without increasing stem length. RIGHT: Moretti engine totals 750cc, puts out 76 hp at 7000 rpm with two dual Webers. Better figures could be realized with a pipe for each cylinder and injection.



Mercedes' success depended largely on the remarkable combination of fuel injection and positive control of the valve gear. Bosch pump metered exact fuel by instruction from a bleed-pressure line connected to a large venturi at the throttle. Fuel metering was directly proportional to the volume air at all speeds.

More emphasis is placed on proper vaporization before the valve seats. Lucas' pump matches the cleanness of the throttles, and the whole unit looks like a good bet for production.

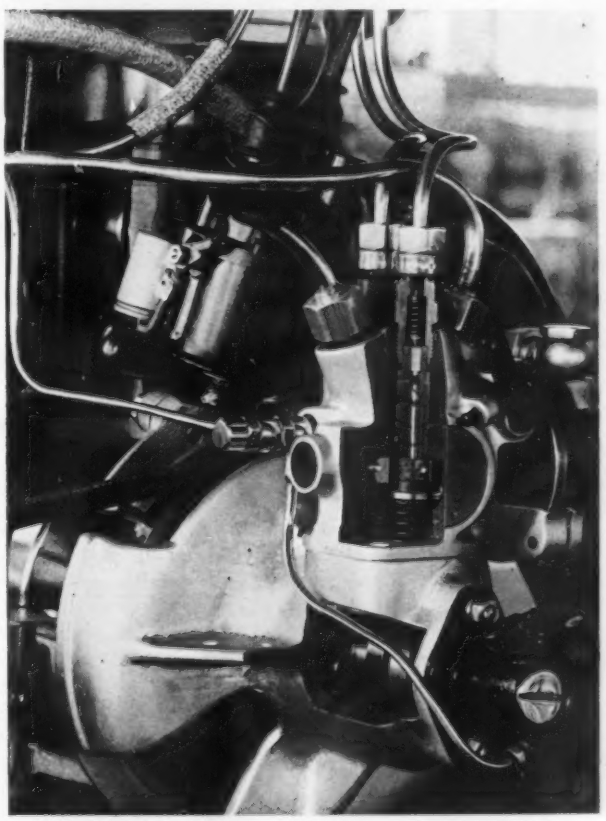
Conspicuous for their absences from this list are Ferrari cars, which haven't been linked by rumor to fuel injection. They, of course, are now running the very potent Lancia V-8's, which were tested with direct cylinder injection back in the planning days. Too much trouble was required to get the right spray pattern and keep fuel off the walls and out of the oil, so they didn't bother. In the spring of '56 Ferrari was unhappy with the performance of Hilborn injection (which they had tried in Italy with the wrong fuel pump) on their 4.4 liter six for Indy, and were busily machining a modified type, with tapered orifices, when the boat sailed. That was the least of their problems.

In slashing contrast are the experiences of Mercedes-Benz, who were able to build an engine from scratch for injection and thus use it to the full. Their extensive war experience with Bosch equipment was no hindrance, and there was little groping in the dark. As we mentioned, their engineers feel strongly that injection offers the most in the lower regions of the power curve, and isn't a significant factor in the *maximum* output of a racing engine. No one else has been able to put this into practice, though all benefit from certain common advantages of f.i.

Uhlenhaut mentions that injection has the effect of raising the octane rating of the fuel, and the 300SLR is running on pump gasoline at a compression ratio of roughly 12 to one, while the M196's special mixture allows much higher figures. As remarked under intake tuning, the cleaned-up induction piping offers much less resistance to resonance in the system, and Mercedes join Ferrari in claiming *better than* 100 percent volumetric efficiency at certain speeds. Finally, a system of positive injection is capable of supplying accurately metered fuel to the engine at speeds so low that the carburetor can't vaporize and meter properly.

The key word is "accurately", and it's here that Mercedes held an edge. Like most SU rigs they brought all the air in

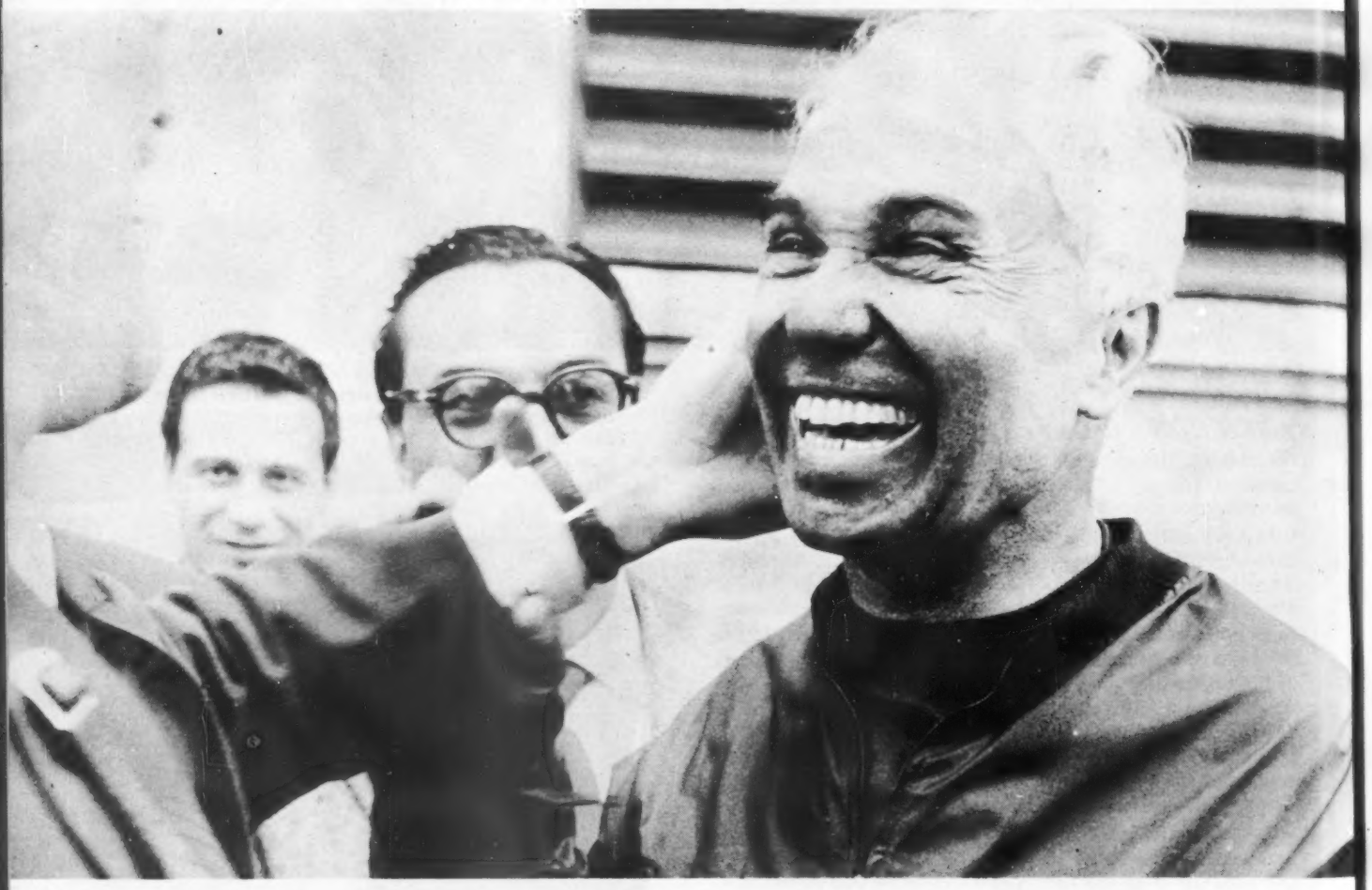
(Continued on page 52)



Operation of Bosch pump is shown in cutaway. Cam lobes at bottom operate separate controlled pistons, one per cylinder. Pump pistons are rotated by metering bar to measure precise fuel "shot."

Unless your name is Piero Taruffi or Stirling Moss, there was only one way to run the Mille Miglia. Prepare the car as best you can and follow the veterans. Ak Miller did his best but he had to . . .

Taruffi's victory in the '57 Mille Miglia marked the end of a fifteen year endeavor to possess that prize. It came in the nick of time, too, for with the demise of 1000 mile run, he would never have had the chance again.



PLAY IT BY EAR

RESULTS—24th Mille Miglia

1.	Piero Taruffi (Ferrari) average speed: 94.6 mph.	10 hr. 27'47"
2.	Graf Wolfgang Berghe von Tripps (Ferrari)	10 hr. 30'48"
3.	Oliver Gendebien (Ferrari Gran Tourismo)	10 hr. 35'53"
4.	Giorgio Scarlatti (Maserati 3000 cc)	11 hr. 00'58"
5.	Umberto Maglioli (Porsche RS Spyder)	11 hr. 14'07"
6.	Camillo Luglio (Ferrari)	11 hr. 26'58"

Gran Premio Nuvolari
(For the distance Mantua-Brescia)

1.	Gendebien	39'43"	123.6 mph (new record)
2.	Von Tripps	40'10"	122.2 mph
3.	Taruffi	40'31"	121.1 mph

Editors note: This story is a follow-up by our European Editor on Ak Miller's attempt at the 1957 Mille Miglia. For a complete tech report on Ak's Kurtis-Chrysler, see the April issue of SCI.

By JESSE ALEXANDER
SCI European Editor

AK MILLER ARRIVES LE HAVRE APRIL 23 ABOARD SS UNITED STATES NEEDS CUSTOMS HELP MEET HIM THERE AND RENDER ALL ASSISTANCE SIGNED JOHN CHRISTY SPORTS CARS ILLLUSTRATED . . .

I received the above cable in the middle of April and accordingly, met Ak Miller and Doug Harrison with "El Caballo" at the French dockside. The "United States" came in at the

Most valuable information came from Denis Jenkinson (center) who volunteered a myriad useful hints. Doug Harrison, at right rode co-pilot with Ak (checked shirt).

horrible hour of 4 AM; I went on board at six, met Ak and his crew, and a few hours later we were struggling down the gangway with the largest collection of luggage ever seen among four men. The race car had been unloaded earlier along with Pete Coltrin's Olds coupe that was to serve as combination tow and scout car.

Customs formalities went fairly smoothly, thanks in large part to the triple "A" rep on the pier; we managed to get two carnets de passage and were just about to begin loading the car when the French Customs official, a female in uniform who looked like a fugitive from the Red Army's woman auxiliary, asked the boys to open the box that just happened to contain about 10,000 feet of 16mm movie film. Now this really put things into a flap. Heads were put together, hands were wrung, many words were spoken back and forth and it began to look as if Ak was going to get stuck with a fantastic import duty. Somehow, however, it was inferred that if a wee bit of money changed hands, the customs people would do us a favor and let it pass. Welcome to Europe!

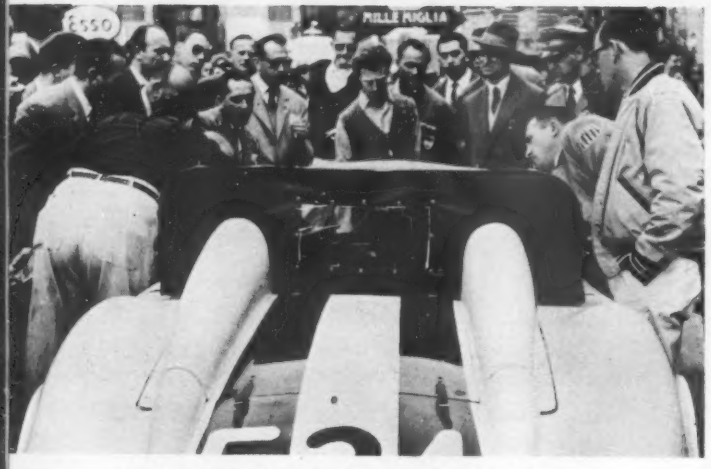
Another hour later and a few thousand French Francs less, we were on the way to Paris, my Porsche leading the way with MUM 816 (the Olds) towing the race car in its trailer, rattling and banging over those horrible Norman cobblestone roads. People stopped and stared; kids, dogs and chickens scurried out of the way, and the Gendarmes, on duty in the center of each little town that we passed through, looked at us most suspiciously, especially when they spied the California license plate. But all went without incident, and by 3:30 that afternoon we were propping up Harry Schell's bar while Ak was trying to make himself understood over the tube to the FIA office. He needed a license for his race car from them. It seemed that nothing would do but he should go to the office in person, so while he and Doug jumped a taxi for the ride to the Place de la Concorde, Pete Coltrin and I scouted around for some hotel rooms, which in Paris, in the spring, are practically non-existent. Thanks to the bartender at Harry's, however, we got in at a place just down the street, practically disrupting traffic on the Avenue D'Iena as we unloaded. Next day found us rolling South through a sunny and green France headed towards Switzerland. Ak had made up his mind to drive straight on through to Brescia as he was eager to get down and turn in some practice laps.

The Swiss frontier was crossed at 2 am, in a tiny border village shrouded in fog and wet. I don't think the guard on duty had ever been confronted with anything quite like this before in his life. Here were five Americans with two cars, one of which was towing a trailer which they said contained a racing car. Very

Umberto Maglioli drove to victory in 1500cc class in a Porsche RS Syder. Placed 5th overall.

Oliver Gendebien in a Gran Tourismo Ferrari flogged previous records on the Mantua to Brescia run. He clocked 123.6 mph, six tenths better than Moss in '55.

Wolfgang Von Tripps just as he finished second place. For a while, Tripps, coming into the Ravenna control, led the pack averaging 115.7 mph. Almost to the end the quarrel for first was between Tripps and Taruffi.



No top, no race! So this lid was quickly fabricated for inspection day. No thing of beauty; even its functional use can be debated especially at a speed of anything over 30 mph.

Friday before the start. The ridiculous top gets a final okay at scrutineering time. NHRA, on duty with the Army in Europe, served as pit crew at various stops along the route.

suspiciously, he cast his tiny flash light over the car papers issue in Le Havre, then decided that before he could put his stamp on them he ought to call his superior officer. A bell was rung and in a few minutes a night-shirted inspector was hanging from an upstairs window of the customs house. A brief conversation ensued between the guard and his chief, then he said, "C'est va"—a few more forms were filled out, stamped and properly filed away, and we were free to move on.

Two and a half hours later found El Caballo approaching the Simplon Pass; Pete was driving the Olds and missed the turn-off for the railroad station where you load your cars onto flat cars to go through the tunnel when the pass itself is closed by snow. The road began to climb, and to wind around hairpin corners banked with snow . . . higher and higher they ground on; finally someone said, "I don't think the tunnel is up here"—so around they went and back down the hill to the quaint little Swiss village of Brig. Once safely on the train, they were at the Italian frontier at the end of the tunnel and that much closer to their objective, Brescia, and the 24th Mille Miglia.

Brescia, city of the Mille Miglia, begins to come alive each year about a week before the race; Ak and Doug arrived about 12 days ahead and immediately set out to map the course and find out just how rough it was.

Piero Taruffi has done the Mille Miglia now 14 times, the '57 race being his 15th; even he, the acknowledged expert and perennial threat in the event, admits that he doesn't know it perfectly; he knows certain stretches, like those down the Adriatic Coast, as well as the back of his hand, but other parts, the mountainous bits North of Rome, are not his forte. This, interestingly enough, shows up clearly in his elapsed times from point to point. If there is a mechanical system that will beat the odds, then Moss and Jenkinson have it in their close partnership that won them the event in 1955 at a record speed of 97.90 mph. Relying on a roll map inside a waterproof box with a plexiglass top which detailed every corner as to speed and surface—every blind brow—every dip, even they had to spend one time this year going over the circuit bringing their map up to date. Thus, the task that Ak and Doug had cut out for themselves was a seemingly impossible one, but they were there and determined to do their best.

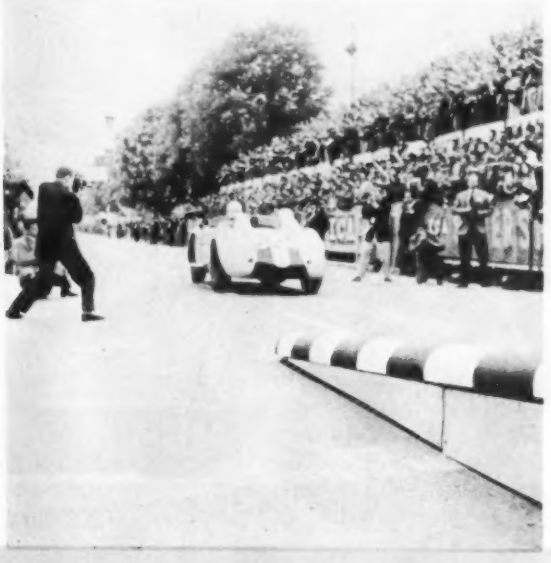
Opposition was more than just formidable, it was damned near overwhelming. At least two 4.5 liter V-8 Maseratis were on tap, one to be driven by Moss, the other by Behra; a brace of 3.8 and perhaps even a rumored new 4 liter Ferrari were on the lists. These would be handled by Collins-Klementaski, Wolfgang Von Tripps, Alfonso de Portago-Edmund Nelson, and last but far from least, Piero Taruffi. In addition, one lone Ecurrie Ecosse D Jag had been entered, to be driven by Ron Flockhart; Two other Maseratis, one a 3 liter with Scarlatti at the helm, and a new experimental 3.5 liter twelve cylinder developed from their latest 2.5 liter Formula I engine, to be driven by Hans Hermann, were among the factory entries, but not really considered to be a threat.

After doing one complete lap in the Oldsmobile, Ak had made up his mind. "We'll play it by ear, try and finish and anything after that will be a bonus."

The time went fast. A top had to be made for inspection. Gas coupons had to be promoted from General Petroleum. All sorts of minor little items kept cropping up. At scrutineering on the Friday before the start, Ak found he had to lay out an additional $125 for liability insurance. The ridiculous top was produced and the officials seemed satisfied. By then several members of the National Hot Rod Association on duty with the Army in Europe had shown up in Brescia, and Ak sat down with them to map out plans for refuel stops and tires. The first gas-up would be at Pesaro—then Rome—then Bologna on the way home. At each of these stops there would also be tires if needed. The boys to man the pits left 24 hours ahead of time, as the roads were closed early. In addition to the GI's at the tire stops, an American film crew were setting themselves up around the circuit to shoot the race as well as trace Ak's progress.

Just thirty minutes before this picture was taken, the powerful Chrysler engine turned temperamental and refused to kick off. Now, on the ramp, the engine idles quietly as the two Americanos await the flag.

Seat belts adjusted, shoulder harnesses set, the seconds are counted off, the flag dropped and down the chute they go.



They're off! Later, as Taruffi passed El Caballo, Ak forgot himself and almost rocketed up the Italian's back.

We spent the Saturday doing last minute items to the car; then gassed up—checked tires, and garaged. Ak was far from optimistic for that single tour around in the Olds had been most impressive. The roads were in a sad state and if they shook the boys up in the Olds, what were they going to do to them in the Kurtis-Chrysler with its solid axles and hard racing tires? If it rained, the 6.5 liters of brute power under the hood would just be completely unusable.

We talked with numerous European motoring personalities. Wilky Wilkinson and Ak discussed injection; we found Umberto Maglioli staying at our hotel and he and Ak reminisced over the Carerra. The most profitable time was spent with Denis Jenkinson.

Jenks filled them on control procedure in the Mille Miglia—how to get the route card stamped. "Just keep rolling, hold your card along the side of the door and let the official worry about stamping it; don't get upset if the stamp is put in the wrong place, for often times you'll get 'Mantova' stamped on your right thumb but no matter . . . and don't worry about the people along the road. They'll be a bit nerve-racking at first but after a few miles you'll get used to them. They'll all wave handkerchiefs at you but this doesn't mean danger, they're just happy. Remember about flag men too; they'll be out on all of the bad corners, but don't rely on them, as by the time you come by they'll be tired and half asleep. Also, there are the usual shut off warnings at the bad corners, but they're meant for the small cars; they figure any one in a fast car should know where the bad spots are and will brake early. In overtaking another car, blink your lights—you'll find the small ones usually cooperative in letting you by. It's the middle-sized 2 liter cars that sometimes give you trouble."

A few last-minute changes in the entries were announced on Saturday. Jean Behra, going too fast in practice near Modena, crashed his 4.5 V-8 and was out of the race. Cabianca, down to drive a 1500cc Osca to give Maglioli a bad time in the lone RS Porsche, suddenly switched to an 1100 car after he also had an accident in training—thus the prospects for a real duel in this

(Continued on page 52)

BUILT BY HAND

Front, side and rear views of the Bud Hand Special. Note excellent workmanship on exhaust headers.

By RUSS KELLY

WHEN the talk gets around to building specials, the statement, "and he did it all himself", usually puts the listener on guard for the apologies that are sure to follow. This doesn't apply, however, if the subject of conversation is the Bud Hand MG Special. From this car's tubular chassis to the hand rubbing of its bright orange paint job, Hand did it all and no apologies are called for.

Begun in 1953 and not completed until May of 1956 this car, like many specials, suffers race-wise from having been too long in the building. But Hand and his partner, Dr. Alan Kerns, feel that this seeming handicap is really an advantage. They have a race car. It's fast, plenty fast from all indications, and reliable. Content to let the Porsche Spyders, Maseratis and dual ignition OSCA's go, they have

found that there is a tough and exciting race for them in the pack, made up of the cars that were winning last year. This race within a race is competitive enough to bring out cut and thrust tactics but happily lacks the pressures that come when that first place position is at stake.

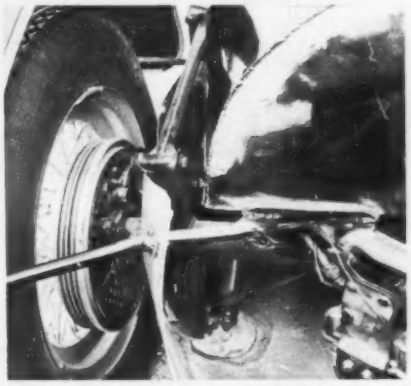
It's plain that Hand's desire to establish his shop slowed the building of this first car. In spite of all these assurances of satisfaction, the impression is inescapable that now the shop is a going concern and if he should decide to build another, it would be with the idea of winning races.

Even though the car is very small dimension-wise, the weight is surprisingly low for an MG-engined Special using mostly production components. With eight gallons of gas, oil and water it tips the scales at 1175 pounds. This indicates that considerable paring and drilling have been done. The engine, a "factory" 1500, has been further modified from the stage four delivery specifications and now delivers 90 bhp at 6500 rpm. The wheelbase is 90 inches, front track is 54 inches; rear track, 49 inches.

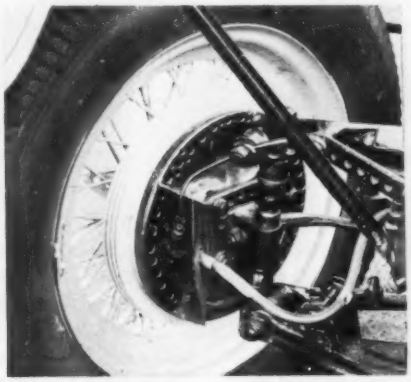
The chassis frame is fabricated of 1.5 in. mild steel tubing with a .054 wall thickness and is gas welded throughout to avoid the possibility of joint fracture. Of double tube ladder or truss layout this unit is obviously strong both in beam and torsion. In plan view the double tube side members are approximately 20 inches apart at the front cross member and widen out to about 35 inches at the firewall. Here a hoop section of 1.5 tubing ties the side members together and serves as a rear engine mount carrier at the bottom and supports cowl, instrument panel and so on at the top. Another half hoop section is used at the rear of the cockpit. Made of heavier wall, .083, it serves also as a roll bar. The lower tubes of the side members terminate just aft of the cockpit and carry the hangers for quarter elliptic springs used in the rear suspension. This lower tube also serves as an air duct to the rear brakes. Funnels located on the front of the tube forward of the radiator pick-up the cool air which passes through the tube and then is carried by supplementary flexible hoses to the rear backing plates. The upper side member tubes are joined in the rear by a deep "U" shaped cross member that carries the gas tank mounting brackets and the spare wheel mount.

Front suspension is by unequal length "A" arms and transverse leaf spring. The upper arms are regular MG TD Armstrong units well drilled for lightness. The spindle supports and spindles are also TD MG but carry TF backing plates. The lower "A" frames were fabricated of one-inch .083 wall tubing. The transverse leaf spring attaches to these lower "A" frames near their outer end. Made up from a shortened 1936 Ford unit, the transverse leaf spring attaches centrally to the lower front cross member tube. A Morris Minor steering box is used along with track rods of the same make. The location of the steering box to the rear of the axle center line made it necessary to reverse the MG steering arms and some bending was needed to get the proper steering geometry. This suspension layout is reminiscent of Ferrari. It certainly looks strong, simple, and troublefree, an ideal setup for a special.

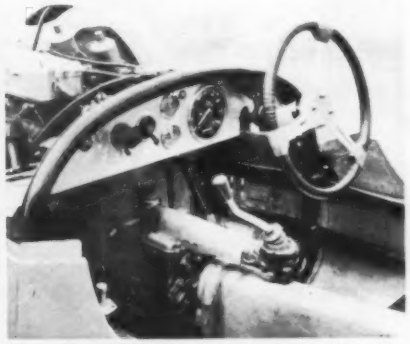
(Continued on page 58)



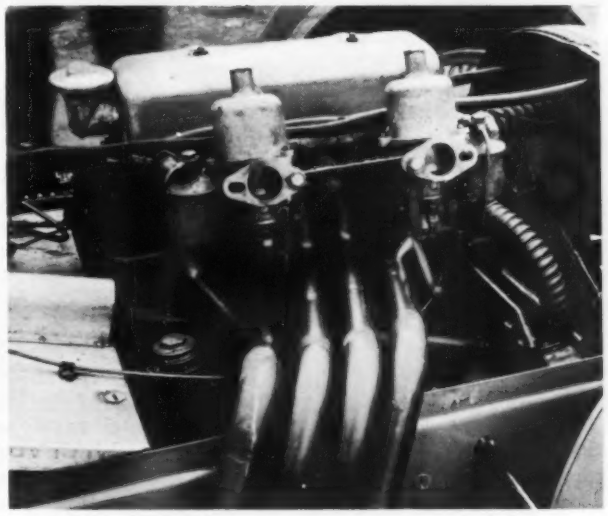
Detail of rear quarter shows radius arm, Watt's link, lower shock attachment, fuel pump.



Brake drums are aluminum finned. Upper "A" frame and backing plates are liberally drilled.



Tachometer is Stewart Warner, other instruments are MG TD. Steering wheel is hand made.

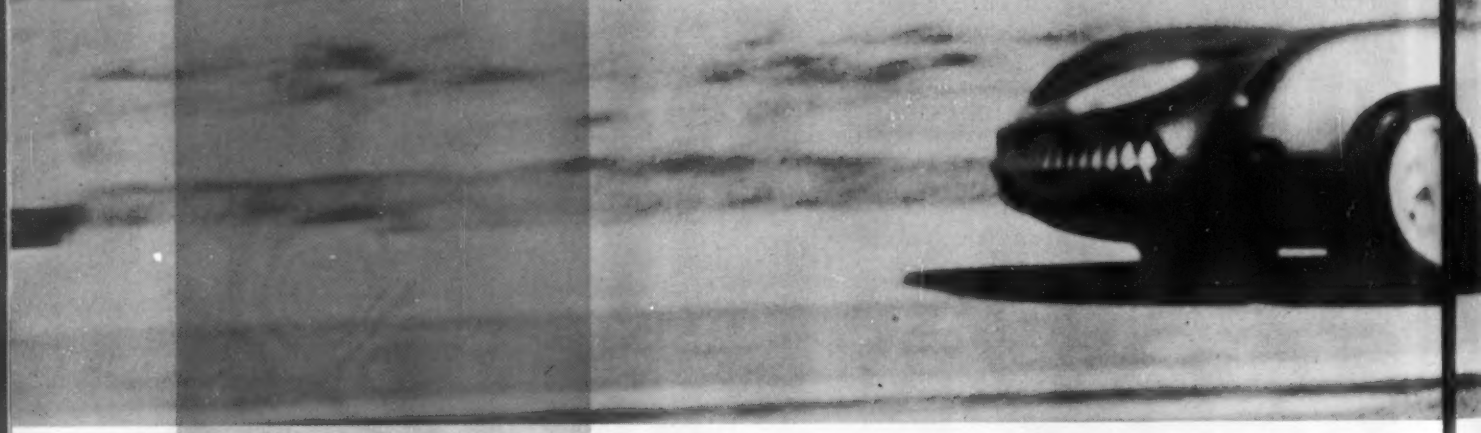


Detail shot of headers. Note how Hand just dodged master cylinder filler cap at lower left.

SCI Technical Report:

By KARL LUDVIGSEN, SCI Tech Editor

CORVETTE SS



REMEMBER the fable of Tantalus? This unfortunate gent was doomed to stand in the midst of a sea with clear, cool water right up to his neck and boughs laden with succulent fruits hovering over his head. When he bent down to drink the sea rushed temptingly away, and the boughs always swung just beyond his reach. This sounds like a rough life, but it's Paradise compared to what GM's been doing to you and me – and to everybody that feels that American cars should be well represented in international racing.

Take a look at the machine laid out on the center spread. It's not a four-alarm advance over all existing equipment, but it is basically a good car. Given more than half a chance and some intensive track testing it could compete on level terms with the world's best–Sebring practice proved that. In view of this highly publicized fact it must have been extremely disappointing to many to hear that it wasn't to go to Le Mans. Perhaps most disappointing to knowledgeable Europeans who felt that Sebring was just a trial outing and expected a full team and all-out effort for the 24-Hours. We won't try to estimate the effect a "no-show" could have on American prestige abroad.

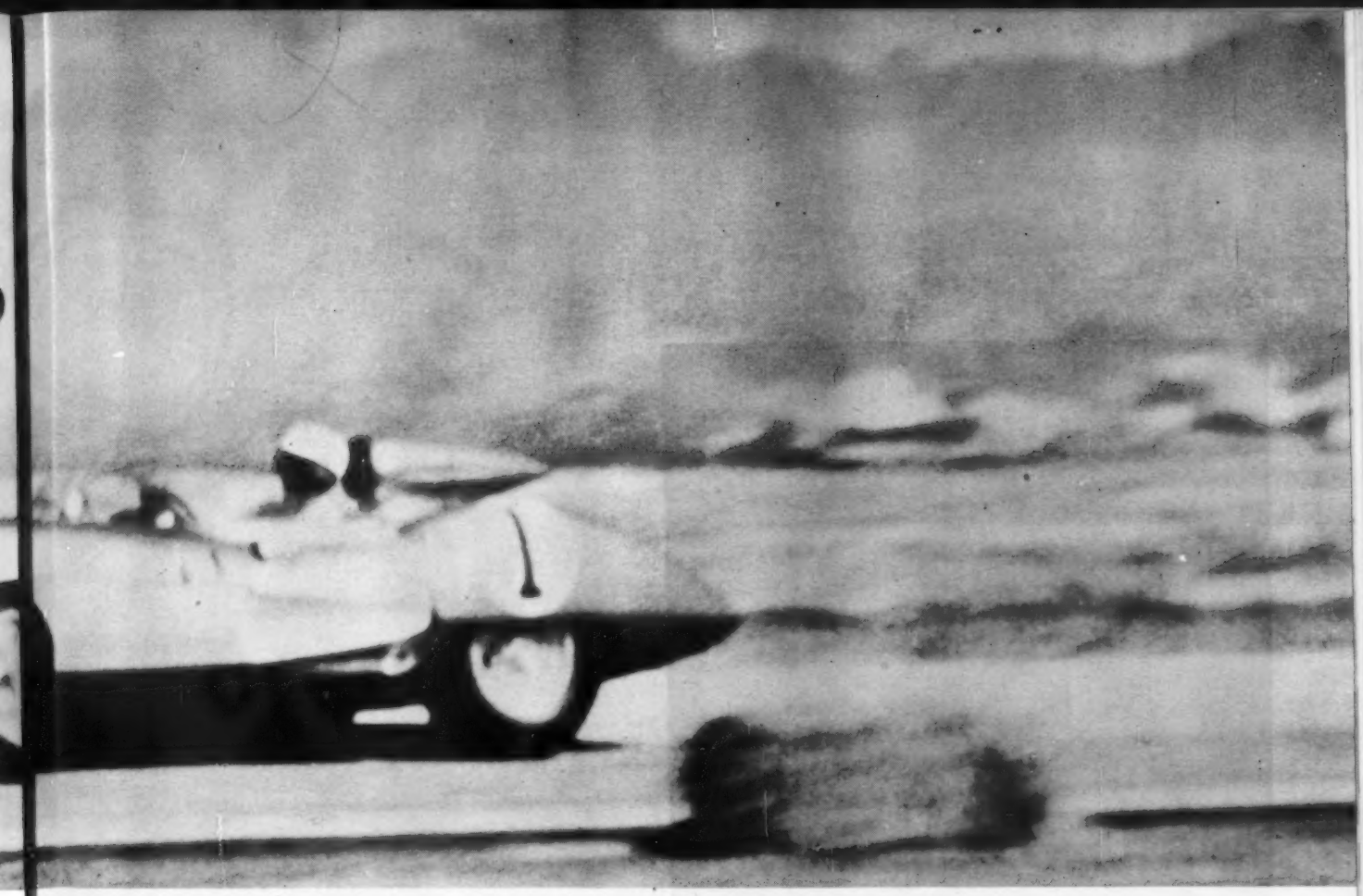
Of course, we can now sit back and see what it was actually all about. We can see that the men who built the Corvette SS were intensely sincere about the job, both as it was specifically outlined to them and as they hoped it might develop. The fine detail design and clean fabrication tell us this, as does their desire to see it compete seriously abroad. We can also see that the management of GM and Chevrolet had only one thing in mind all the time: to bask in all the publicity and excitement that they knew such a sensational Sebring entry would shine down upon them, and then to forget about it except possibly for some minor events in this country. Also, naturally, to "show the world that GM could really clean up if they wanted to."

They warned us that this was all. When the SS was announced Chevy General Manager Ed Cole "emphasized that it is a research project to study advanced engineering characteristics in the field of performance, handling, braking and *other* safety features". The word we italicized is Chevy's loophole in case another Congressional committee shouts "Speedmonger!" This was all they did and do intend, but they led many people on for too long, even poor Zora Duntov, who will probably take some of the public blame for the defection. Even Briggs Cunningham, who was scheduled to run the SS at Le Mans, wasn't told "no" until a month and a half after Sebring. And mostly they led on the rest of us who'd like to see these cars go out and DO something.

How did the car get built in the first place? A couple of top-level minds happened to click and the whole thing was shoved through as a triple-priority crash program with Sebring as a definite deadline. Now there's no more deadline–no place to go. The next may be the SCCA Nationals, or perhaps Bonneville. Money is available, but authorization to use it is being withheld until Chevrolet does better in this little sales tussle with Ford. Some may say that race wins by the SS would boost Chevy sales, but we don't think so. Production Corvettes might get a little more play but hardly enough to pay for the racing operation.

No, GM had every justification for handling the SS this way. We can only wish that there had been less pomp and a little more circumstance at Sebring, if that remains the only major appearance of the SS. We can also hope that the work of Duntov and his crew will be invested in future production Corvettes, since the present four-year-old chassis may be pushed hard by the new Mercedes 300SL Roadster and the Jaguar XK150. In any case the SS gives us a window through which we can see what Chevy Engineering has up its sleeve.

With only five months to design a raceable car, the SS project was definitely a rush job for GM. As a result, Duntov had to rely heavily on components which had been thor-



oughly tested before, and could only lighten them if possible and fit a new framework around them. Fortunately a lot of miscellaneous information had been compiled from experimentation and racing with stock Corvettes and the special SR2 versions.

For one thing, they knew pretty well what the 283-inch V8 could and could not do. When the displacement was boosted from 265 there were some misgivings about the crankshaft, but undercutting the fillet radius at the journals has kept this glued together at 7000 and up. A weak point did show up at the wrist pin bosses in the piston, which distorted at high revs—notably in the badly overrevved SR2 at Nassau—and came apart. A little more meat around the boss cured that. Development on the SR2 for Daytona also led to the 40 inch tuned exhaust length that was incorporated in the SS. Racing during the winter helped to shake down the Rochester fuel injection system and determine its limitations.

Pressure of SCCA "Production" racing had forced the development of a four-speed gearbox, which with the use of an aluminum alloy case was just right for the SS. The iron case box, by the way, was available as of May first for $189 extra, or about the markup asked for the automatic transmission. Sounds encouraging.

The rush program for Sebring in 1956 turned up the sintered metallic and ceramic brake lining that's been used on most racing Corvettes with considerable success. They're fine if you don't mind replacing the drums fairly frequently and *warming up* the brakes before using them hard. A type of drum finning was also devised that appeared to give good results.

With these for a start Duntov had to build a light, compact car with handling of a very high order. Since time was short the 300SL frame was elected as a good pattern to follow, and the placement of the main SS chassis tubes resembles the SL very closely—NOT the D-Type Jaguar, as the rumors have run for so long. When the major members were set smaller tubes could be added for the particular requirements of this engine and suspension and to add stiffness where stress tests showed it to be needed. Big cross tubes connect the abutments for the front and rear coil springs, the rear mounts being nicely curved and drilled towers. Where parts like the brake servo cylinders are attached the frame tubes are square, to ease mounting, but otherwise they're round and about an inch in diameter. Particularly reminiscent of the Mercedes are the pyramided tubes at the cowl and the truss structure under the doors.

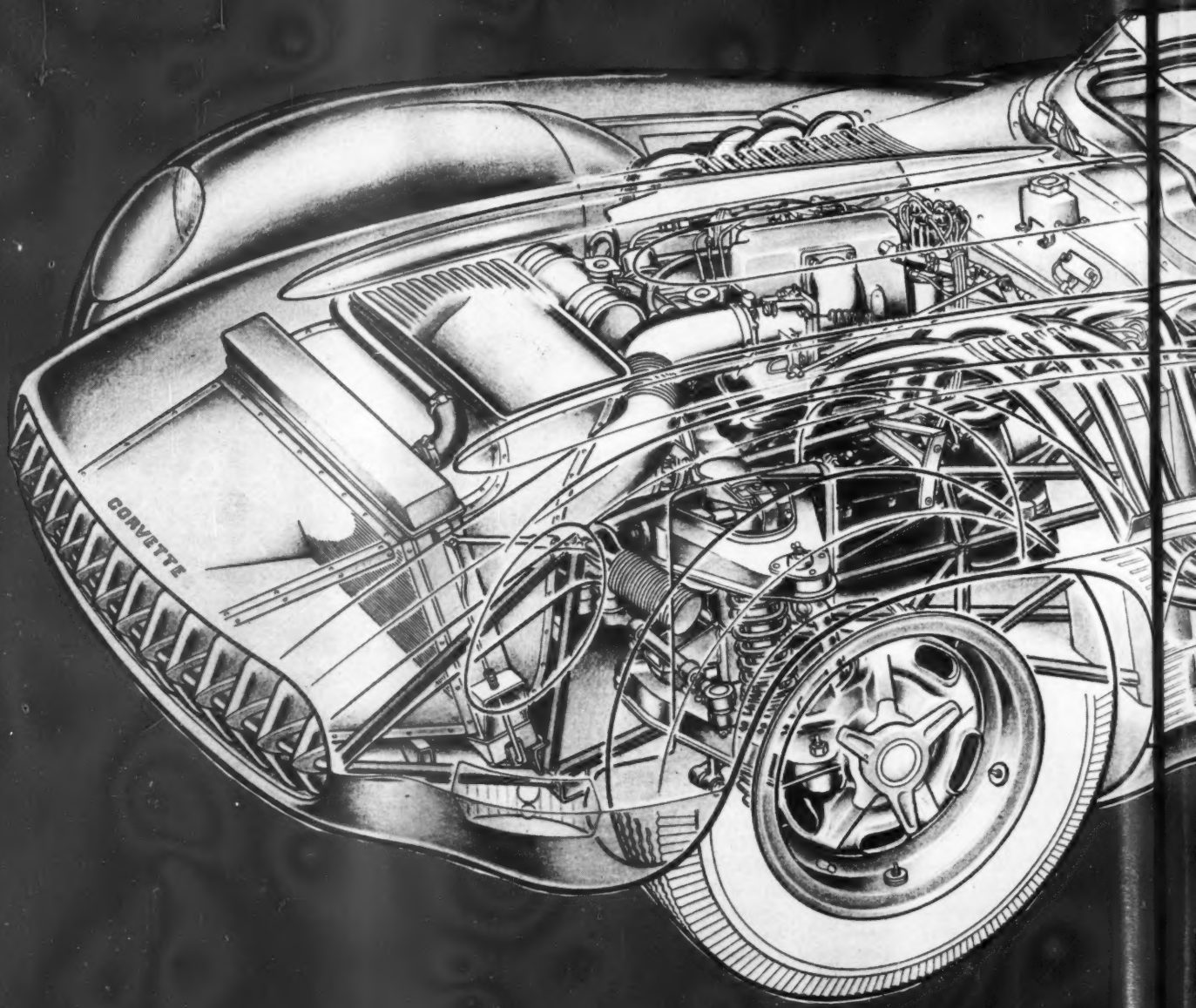
Front suspension resembles that of Chevy passenger cars in that the non-parallel wishbones are welded up of steel pressings, but the whole assembly is scaled down. Ball joints are fitted at the outer ends, and the wishbone frame pivots are rubber bushed. With more time metal-to-metal bushings might be installed for more precise control. A small-diameter anti-roll bar crosses the chassis under the suspension and is connected to the bottom wishbones by short links.

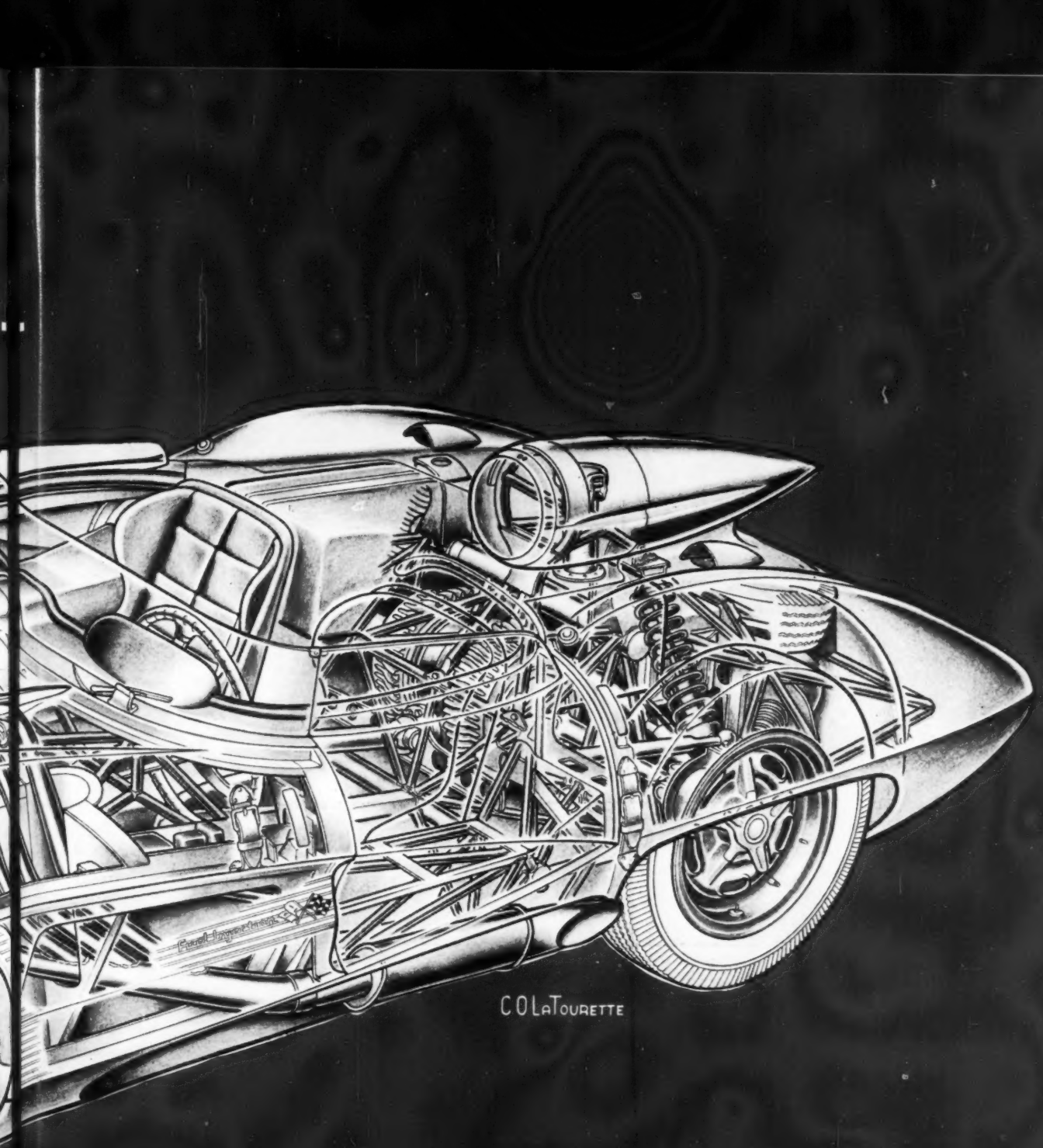
Nobody interested in fast cars will be shaken by de Dion rear suspension, but it is a novelty for Detroit machinery (except for notable show cars like the Le Sabre, Firebird I, the La Salles and Pontiac's Club de Mer, only two of which ran). Though the rear end looks confused, the curved one-piece de Dion tube is fabricated and located very neatly indeed. There are four tubular trailing arms, two of which are rubber-bushed to the frame just forward of each rear wheel. The upper arms angle slightly outward and are ball-jointed to the tops of the hubs. The lower arms however converge to the center of the axle tube and are fixed to the underside of the tube by ball joints at that point. A rigid yet light three-point location resulted, the frame mounting of differential and brakes relieving the tube and arms of drive and braking torque reactions.

The arrangement of the bottom trailing arms was one of the few brand-new features of the SS, but it's worth remembering that this was the source of one of the failures that

(Continued on page 54)

CORVETTE SS — too little time, too many cooks, but . .





TEST CAR: CORVETTE SS

SPECIFICATIONS

POWER UNIT:

Type	V-8	
Valve Arrangement	Overhead in-line, pushrods.	
Bore & Stroke (Engl. & Met.)	3⅞" x 3" (98.4 x 76.2 mm)	
Stroke/Bore Ratio	0.774/1	
Displacement (Engl. & Met.)	283 cu. in. (4640 cc)	
Compression Ratio	9/1 (11/1 optional)	
Carburetion by	Rochester constant-flow fuel injection	
Max. bhp @ rpm	310 @ 6000	
Max. Torque @ rpm	295 @ 4400	
Camshaft: Chain-driven "Duntov", 0.398" lift, solid tappets.		
Valves:	Intake	Exhaust
Opens	35° BTDC	76° BBDC
Closes	72°ABDC	31° ATDC
Diameter	1.85"	1.625"

DRIVE TRAIN:

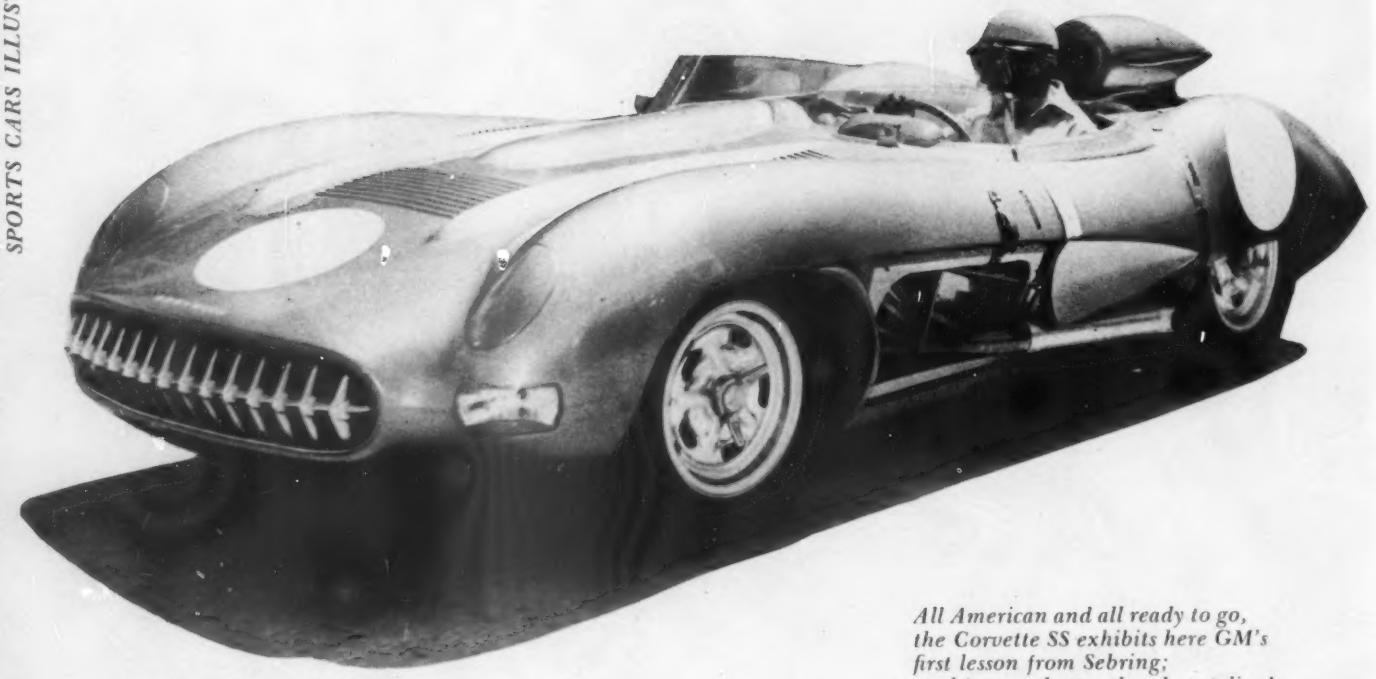
Transmission ratios	
I	1.87
II	1.54
III	1.22
IV	1.00
Reverse	1.87
Final drive ratio	3.87/1 with Halibrand quick change, Positraction differential.

CHASSIS:

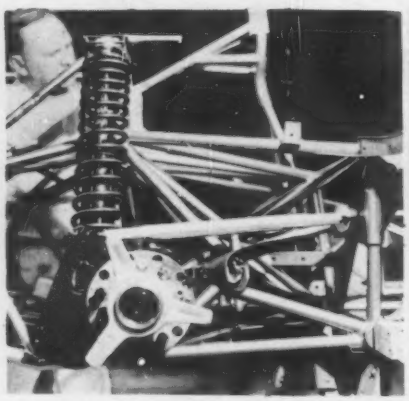
Overall length	168"
Wheelbase	92"
Front Tread	51½"
Rear Tread	51½"
Weight, dry	1850 lbs.
Suspension, front	Non-parallel wishbones, coil springs, anti-roll bar.
Suspension, rear	de Dion, coil springs, four radius rods.
Shock absorbers	tubular, in unit with coil springs.
Steering type	Saginaw recirculating ball, three piece track rod.
Steering ratio	12/1
Brake system	One master cylinder, two separate servo systems.
Brake mechanism	Chrysler Center-plane 2LS with 12" x 2½" drums and Cera-metallic linings.
Wheel	cast magnesium with knock-off hubs.
Tire size	6.50/6.70 x 15 front, 7.10 7.60 x 15 rear.
Fuel capacity	43 U.S. gallons.

RATING FACTORS:

Bhp per cu. in.	1.096
Bhp per sq. in. piston area	3.30
Torque (lb-ft) per cu. in.	1.04
Pounds per bhp—test car	6.6
Piston speed @ max bhp	3000 fpm

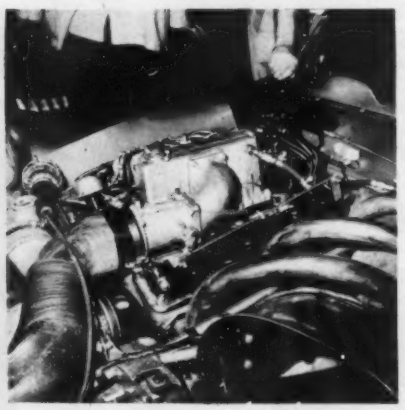


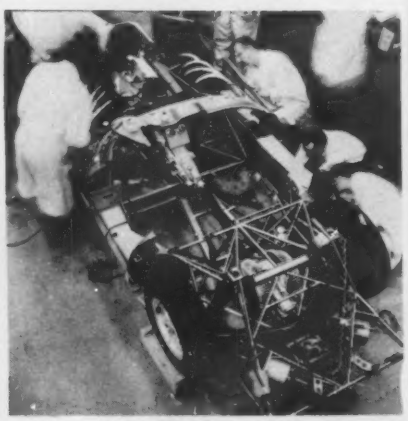
All American and all ready to go, the Corvette SS exhibits here GM's first lesson from Sebring; cool feet are better than hot styling!



There are rubber bushes which eventually caused GM to retire the SS in early hours of race.

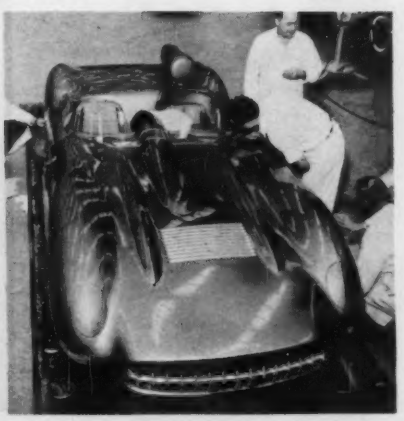
Forward facing air metering valve leads cool air from Fiberglas duct to plenum chamber of injector.

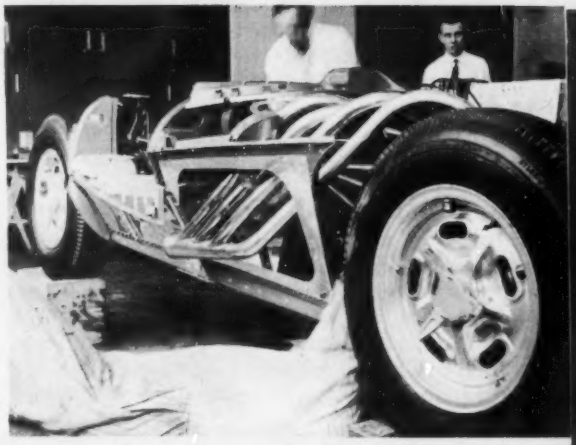




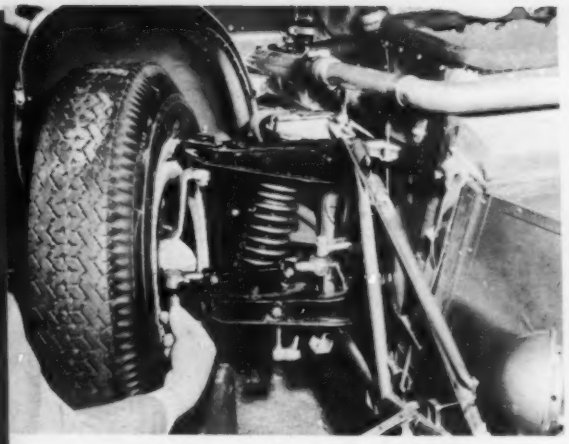
Everybody hustles to finish Chevrolet's activated dream car in time for debut at the Florida Grand Prix.

Details of finish are attended to with concern that might embarrass some Concours d'Elegance entrants.

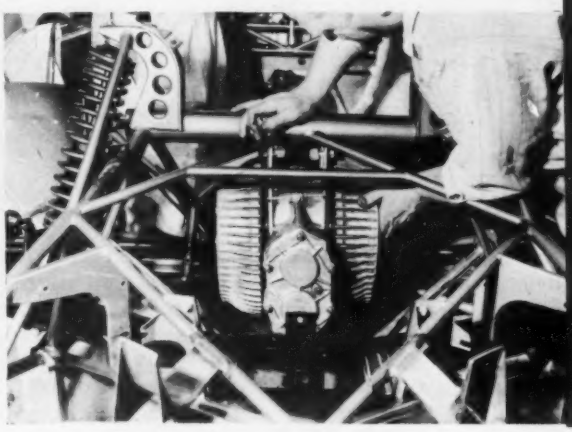




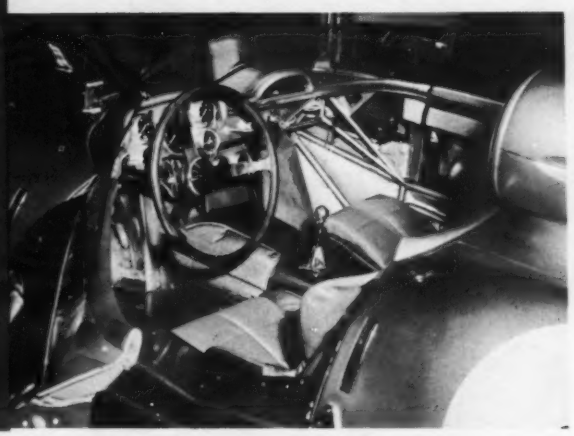
Forty inch tuned exhaust headers arch high over frame tubes, then down and aft. Rear ones got cockpit too hot so they'll be moved forward.



Radically finned aluminum muff on the cast iron drum acts as an impeller because it's so closely shrouded by the rim of the magnesium wheel.

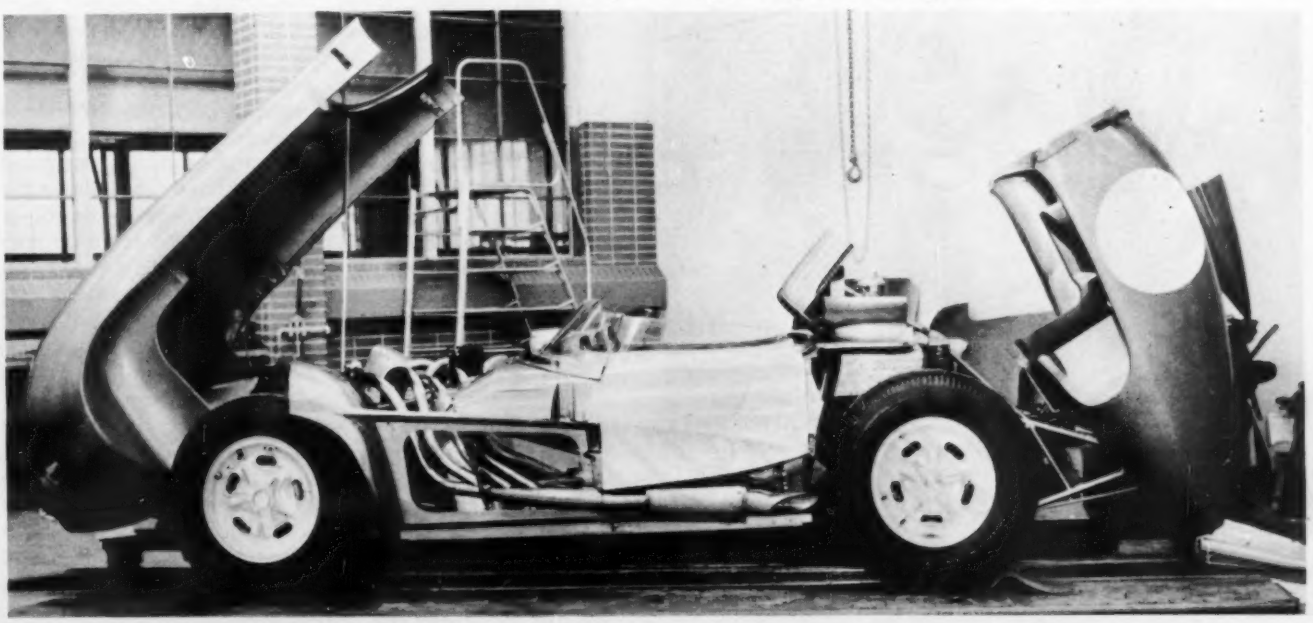


De Dion layout on SS includes inboard mounted Chrysler Center plane brakes, and Halibrand quick change rear. Brake linings were cerametallic



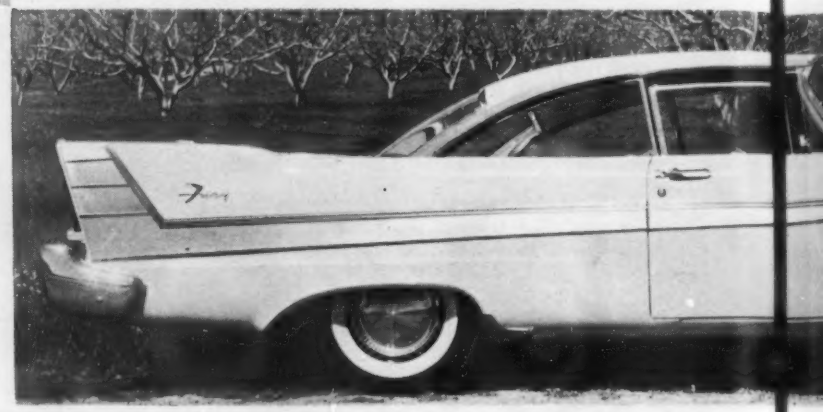
Styling department gave Corvette interior a typical dream car look. Exhaust heat, cleverly channeled into driver's compartment made cockpit unbearable.

Hinged body sections afford excellent accessibility to all components of car. The latest in production design, it is typical of such cars as D-Jags and Loti. Specials have been using similar plan for years, although not as well executed.

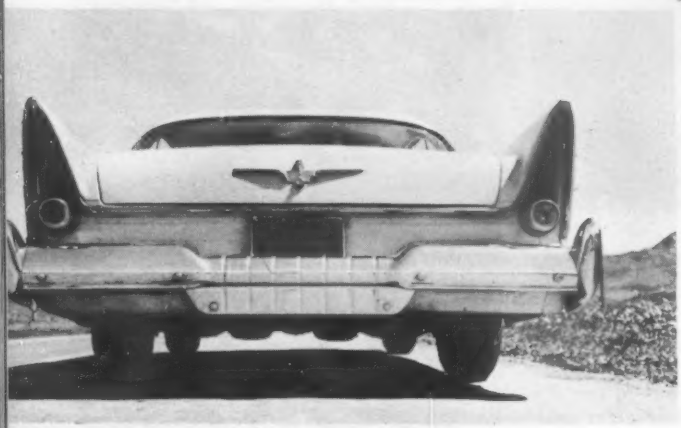


AS THE world knows, the 290-bhp Fury is a very hot family-size car. But what impressed us most during an 800-mile wringing out of this clean projectile had little to do with the car's brute strength. Its greatest merit lies in its handling qualities.

The Fury corners with a smooth agility that formerly has been obtainable only on outright sports cars, usually the kind that are sprung like a park bench. But there isn't a trace of harshness in the Fury's ride nor is there any tendency to pitch, roll or tramp. Imagine if you can a wedding of Detroit creampuff ride with first-class sports car handling and you'll have a pretty fair picture of the Fury's road manners. This is more than just a successful engineering compromise; it's a genuine achievement, an important "advance," to use the jargon of the trade. This improvement is shared by all '57 Chrysler Corporation products to varying degrees and for this the company and its engineers deserve exceptional recognition.



ABOVE: Fury is indistinguishable from stock Plymouths from front view. Inside lights are parking and directional lamps. RIGHT: In profile Fury stands apart from sister line by two distinguishing features—the Fury signature and the white-and-gold color scheme. BELOW: Rear fender fins are moderate in height, not exaggerated. Back is not overly ornate, but simple and clean in line.



The Fury is the best-handling, best-riding Detroit sedan we've ever driven. The basis for this, of course, is Chrysler's new suspension system with longitudinal torsion bars at the front and outboard-mounted leaf springs at the rear. There is no magic in torsion bars, *per se*, that accounts for the improvement; it's as easy to build a bad torsion bar layout as any other. The important point is the level of performance that the designers make up their minds to achieve, and the standards were set sky-high for Chrysler's '57 lines. The Fury, however, uses heavy duty springs and shocks all around but although they're about 25 per cent stiffer than on the normal Plymouth no penalty of harshness is apparent. The Fury's torsion bars are adjusted downward and the leaf springs are

SCI ROAD TEST:

Plymouth Fury

mounted lower to bring the frame and body a half inch closer to the ground. The stiffer springs and lower center of gravity make the anti-sway bar fitted to past Plymouths unnecessary and it is deleted from the entire line. Among the many factors contributing to its superior handling are wheels with six-inch rims in place of the five-inch rims used on the standard Plymouth.

It's very difficult to adjust to the fact that here is a big Detroit sedan that can easily out-corner many *bona fide* sports cars. You bend it through turns faster and faster, looking for its limits of adhesion and expecting the typical Detroit vices to appear. But they don't. You don't have to pull hard on the wheel to hold the car in the turn; it tracks effortlessly in the direction it's aimed. In spite of startlingly high cornering speeds there is barely a trace of tire squeal. Instead of the front end pushing out as with the typically nose-heavy

Detroiter when pressed hard, the Fury's rear wheels slide just the right amount and they do it gradually and controllably. When you rock the steering wheel on the straight to simulate S-bend weight transfer the body does not rock on the springs at all. It sets a new standard.

As an accelerating machine the stick-shift Fury has a unique personality due to its being cammed like a competion car, but for different reasons. The engine develops its peak torque at the lofty figure of 4000 rpm—1200 higher than the regular 301 cu. in. engine. At low revs it has very little torque indeed.

With Chrysler's three-speed torque-converter transmission this creates no problems. First speed is 2.45 to one and it is multiplied by as much as 2.7 by the converter, which produces genuine jackrabbit starts. But with the manual-shift trans, bottom cog is 2.5 to one, period. Evidently the Fury's cam design incorporates no compromises in favor of the fast-disappearing stick-shift box.

The result is that good as its acceleration times are, those of the stick-shift Fury are not all that can be expected from a machine pulling less than 14 lbs. per bhp, wet. To get the best times nothing short of a full racing start will do, with the engine wound out to a screaming pitch before the clutch is popped. Elapsed time for zero to 30 mph with a 2800 rpm start was 3.2 secs. By using about 4000 rpm before letting out the clutch we were able to chop this to 2.8. Nevertheless, when the clutch bites the flywheel it pulls engine revs down low in either case. The impression during the 2.8 run was that the first two seconds were consumed in getting the car off the line and that, once moving, it leaped from zero to 30 in the remaining eight-tenths.

Acceleration on the road with the Torque-Flite equipped Fury can be startling at times even to those used to sports cars of the more impressive variety. Normally only one of the two quad carburetors is in operation and, under cruising conditions, only two of the four barrels are in operation. As one pushes the accelerator pedal the carb acts as a normal quad unit and the other two barrels come into operation

SCI's test curve is quite sharp and no mistake. Here the Fury bores at 55 mph with hardly a murmur from the tires. A more expensive import tested on this corner emitted screams that could be heard a mile.

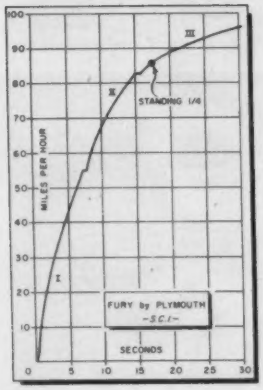
Fifth wheel accurately measures mph for both high and low speed runs. See specifications for speedo error.

with a resultant increase in speed that by today's standards is not particularly impressive. Toe the pedal a little harder and the second carburetor comes in with an insistent push at the shoulders and hip pockets. Push again and the pedal rides over a slight spring resistance; suddenly you're moving out with a tremendous rush as the transmission kicks down from high to second gear. Go back again to cruising on two barrels and high drive then slam the pedal to the floor. All of the above effects occur at once and in the space of time it takes to get past one car you're going fast enough to bite off two more before you slow down unless you've been gentle with the accelerator. This is the kind of performance expected only in a competition car yet under proper guidance it's as docile as a kitten in traffic. It's an experience that has to be felt to be believed particularly by those who in past years have considered Plymouth products to be fit only for little old ladies from Pasadena.

Because of the high-rpm torque peak and because the torque curve evidently drops off rapidly as revs drop, second gear is of vital importance for passing and can be used up to a true 85 mph. To punch the throttle at 50 mph in top gear and expect a surge of power is to be mistaken.

The conclusion we draw is that the regular Fury package has been designed around the torque-converted transmission. If you're a die-hard who wants a stick shift—and I'm one—and you're buying a Fury—and I'd be delighted to—one of your first moves should be to invest in a specialist camshaft that will provide a useful amount of thrust over a more useful rpm range. Then you'll be able to jet off the line as well as the torque-converter jobs, if not better. As it is, you can't lay a smudge of rubber no matter how violently you strive for a solid getaway bite. Another alternative would be to specify one of the six lower (higher numerical) final drive ratios such as a 3.9 or 4.1 to 1.

Sharp inward turn of front wheels indicates strong understeer characteristics. At cornering speeds of 55 mph, the rear wheels would slide outward very gradually. Body roll was very slight.



Furry Fury mill has lots of extras including twin carbs, hotter-than-stock cam, and solid tappets. In top tune, torque is all at upper rpm ranges.

If the manual shift box in our test Fury is representative, there's much room for improvement. First or Reverse could *not* be engaged without severe grinding of teeth unless the lever was first dropped into a synchronized position. Up- or downshifts to Second were very difficult and often downright impossible. Because of the engine's torque characteristics it would be very handy to be able to downshift to First while in motion, but this defied our hardest double-clutch efforts.

That's one point to watch if you're shopping for one of these cars. Another is the fit of the rear axle hub tapers. Those on our test car did not match precisely, with a resulting clank during even light acceleration or deceleration. These tapers will wear to fit each other but in the meantime a certain amount of axle-nut tightening will be necessary. Be sure your dealer is prepared to provide this service.

For sheer speed the Fury is rapid enough. Using a one-mile approach to the measured quarter-mile timing trap we clocked 115 mph. The car had some acceleration left, but not much. With an approach twice as long it should be possible to get close to 125 mph if you're in that much of a hurry. At 115 we can state that the Fury feels just as secure as at much lower speeds, and this can be said of few cars. The front end does not develop a light feel nor does it hop about—further proof of the car's excellent suspension and handling.

(Continued on page 57)

PLYMOUTH FURY HARDTOP COUPE

PERFORMANCE

TOP SPEED:

Two-way average	113.6 mph (one mile approach)
Fastest one-way run	115.2 mph (indicating about 130 mph)

ACCELERATION:

From zero to	Seconds
30 mph	2.8
40 mph	4.1
50 mph	6.3
60 mph	8.5
70 mph	10.7
80 mph	15.2
90 mph	21.7
Standing ¼ mile	17.2 secs.
Speed at end of quarter	78 mph

SPEED RANGES IN GEARS:

I	0-55 mph
II	?-85 mph

SPEEDOMETER CORRECTION:

Indicated	Actual
30	30
40	38
50	47
60	55
70	63
80	71
90	79
100	86
110	93

FUEL CONSUMPTION:

Hard driving on test	11.0 mpg
Average driving (under 60 mph)	12.7 mpg
At steady 30 mph	23.5 mpg

BRAKING EFFICIENCY (10 successive emergency stops from 60 mph, just short of locking wheels):

1st stop	78
2nd	74
3rd	64
4th	57
5th	45
6th	45 (one minute wait)
7th	66
8th	64
9th	51
10th	48

SPECIFICATIONS

POWER UNIT Plymouth V-800:

Type	90° V8, polysphere combustion chambers.
Valve Arrangement	Pushrod OHV, mechanical lifters.
Bore & Stroke (Engl. & Met.)	3.91 x 3.31 ins.; 99.3 x 84.1 mm
Stroke/Bore Ratio	0.85/1
Displacement (Engl. & Met.)	318 cu. ins.; 5212 cc.
Compression Ratio	9.25/1
Carburetion by	dual Carter 4-barrel
Max. bhp @ rpm	290 @ 5400
Max Torque @ rpm	325 @ 4000
Idle Speed	500 rpm

DRIVE TRAIN:

Transmission ratios I	2.50
II	1.68
III	1.00
Final drive ratio (test car)	3.54
Other available final drive ratio	3.18, 3.36, 3.73, 3.90, 4.10, 4.30, 4.56, 4.89.
Axle torque taken by	Rear springs.

CHASSIS:

Wheelbase	118 ins.
Front Tread	60.9 ins.
Rear Tread	59.6 ins.
Suspension, front	Longitudinal torsion bars.
Suspension, rear	Longitudinal leaf springs, outboard of frame.
Shock absorbers	1-in. piston Oriflo.
Steering type	Manual: Worm & 3-tooth needle-bearing roller. Power: Rack & Gear Sector with Recirculating Ball Nut.
Steering wheel turns L to L	Manual: 4.8. Power: 3.4.
Turning diameter	42 ft. 4 ins. curb to curb.
Brake type	Center-plane, 11 x 2 ins.
Brake lining area	184 sq. ins.
Wheel studs, circle diam.	5½ in. studs; 4½ in. circle diam.
Tire size	800 x 14.
Rim width	6 ins.

GENERAL:

Length	206.1 ins.
Width	79.4 ins.
Height	53.7 ins.
Weight, test car	3960 lbs.
Weight distribution, F/R	53/47
Fuel capacity—U. S. gallons	20

RATING FACTORS:

Bhp per cu. in.	.91
Bhp per sq. in. piston area	3.02
Torque (lb-ft) per cu. in.	1.02
Pounds per bhp—test car	13.7
Piston speed @ 60 mph	1500 fpm
Piston speed @ max bhp	2979 fpm
Brake lining area per ton (test car)	93 sq. ins.

Donald Healey ascending the famous Shelsley Walsh hillclimb, Worcestershire, England, in the Healey roadster which placed him and son Geoffry ninth a few weeks earlier in their first Mille Miglia try—1948. (They averaged somewhat over 100 mph).

SIXTY FAST YEARS

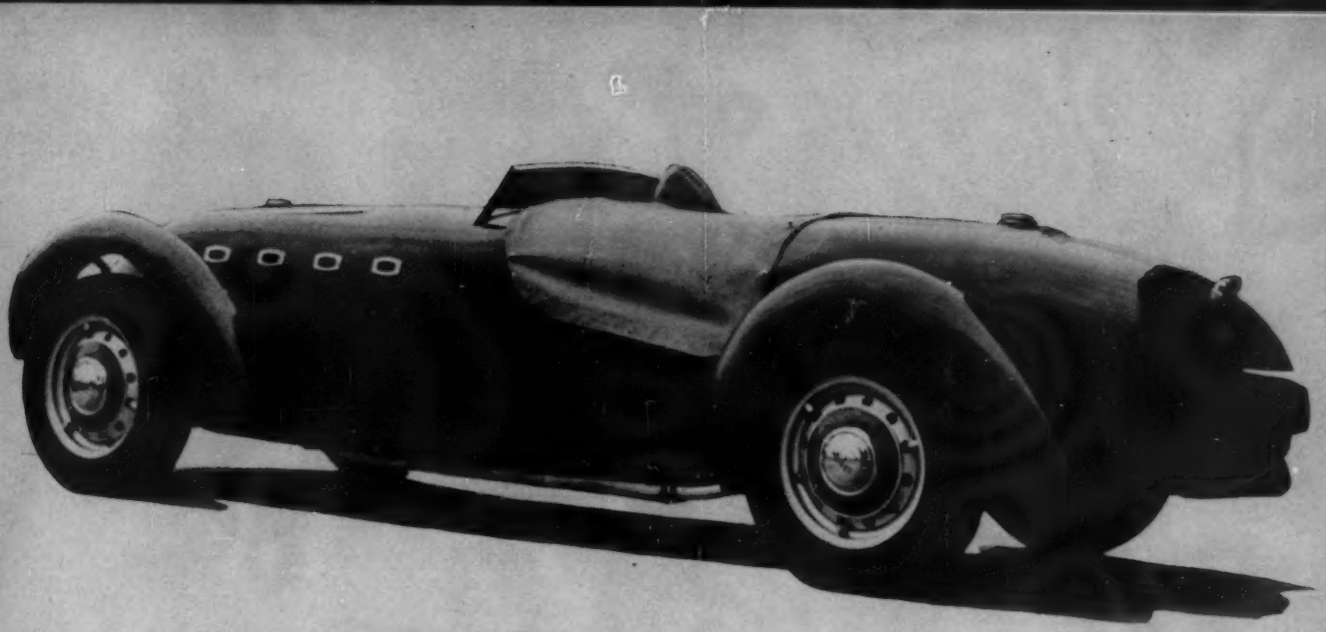
Designer of one of the world's most popular sports cars, Donald Healey still hunts for records at the age of 60. Next goal: 300 mph!

By DENNIS MAY

SOON to enter his sixtieth year, and with three decades of race and competition driving behind him, Donald Mitchell Healey has reached an age and a position where many men would be content to let their bellies outgrow their chests and to start thinking in the past tense. But with Healey, designer and co-maker of one of the world's most successful sports cars, it is otherwise. As a businessman he moves so fast that, in the words of one of his staff, "you have to get in his slipstream to keep up with him." In the records field his 1957 endeavors are bent on beating 300 mph with an Austin-Healey of 3 liters displacement — with himself as driver, naturally.

If he brings it off, this will make him the fastest sexegenarian on wheels, easily; and unless Donald Campbell gets in first with the Land Speed Record he's planning, Healey will also be one of only two triple centurions alive. The other is Capt. George Eyston.

Before the '56 Bonneville trials, Donald relaxes in a prototype AH 100-6, with supercharger and lengthened body. In it, he later satisfied speed ambition—turning 209.9 for two way mile.



This, the first U. S. imported Silverstone Healey—with Riley engine. Briggs Cunningham took one look at it in 1949 and decided to swap Riley for Cadillac mill.

Driver Donald and son in AH at start of '51 Mille Miglia. The Healey chassis/Nash engine wedding came out of chance meeting with Nash-Kelvinator past president, Geo. Mason.

The life of Donald Healey is lived, metaphorically speaking, in cablecar transit from one peak of ambition to another. He had always hankered, for instance, to drive at 200 miles per hour; and in due course he did so, turning 200.9 mph for the two-way mile at Bonneville in August of last year, using a prototype Austin-Healey 100-6 with supercharger and *rennlimousin* body. With this target attained he could quite becomingly have shaken the salt from his feet forever and taken vows to begin being his age. The fact is, though, he *isn't* his age by any yardstick except the almanac, and so, true to temperament, he quiety transmuted yesterday's ambition into today's steppingstone.

Of course, there is some rational justification for pressing on to three centuries. That 200.9 mph, although a spanking clip for a sports car derivative of only 2.6 liters capacity, based upon so unpretentious an engine as BMC's C-type, didn't cause the FIA to bat an eyelid: this because the international Class D record for the flying mile still stands where it has stood these eighteen years — at 248.3 mph, clocked by Rudolf Caracciola (V-12 Mercedes-Benz) on a German autobahn in 1939.

With disarming honesty, Donald Healey admits that sprints achieved with the aid of supercharging and a radically non-standard body shape are practically meaningless as a criterion of his production wares. He undertakes them, he says, simply because in the U. S., where most of his output is sold, they produce a useful publicity impact. The British are less impressionable in such matters, and if a figure isn't specifically a record they just don't want to know about it.

Once you start adding blowers, roofing in cockpits and extending noses and tails to lengths that wouldn't conceivably be acceptable on a road car, you might just as well take leave of the original blueprint entirely, Mr. Healey plausibly argues. Accordingly, the next Austin-Healey migrant to Bonneville will probably have the driver's turret out ahead of the front wheel centers, *à la* Cobb, and be powered by a new engine giving around 450 horsepower and closely crowding the 3 liter limit. This would represent an increase of 150 bhp over the 1956 output with blower.

Whether the top end of the projected engine will retain a resemblance to the current Hundred powerplant remains to be seen, but the extra displacement sought cannot be gotten with the existing cylinder centers. In other words, this isn't just an overboring operation.

On and off, Healey has tinkered with the idea of a prone driver position for his short distance record car, and it may be that the 1957 edition will follow this recipe for minimal cross section.

According to him, the aerodynamic shape of last year's sprinter left plenty to be desired, but not all the evidence points that way. Three or four times, it may be remembered, backfires caused the blower drive chain to break at speed. One of these times the breakage occurred a quarter-mile

(Continued on page 60)

Laden with badge bars, side mirrors, trunk load of chrome, tools, plaques, and other unnecessary ballast, Jag broils the quarter in less than 15 secs.

DRAGSTRIP DANDY

By *RUSS KELLY*

A couple of hundred years ago you knew it was the gent in the fancy suit you had to look out for. He had a dirk up each ruffled sleeve and like as not, another in his pleated shirt front, but times change. Today we expect things to look the way they're going to act and on a drag strip we like to think we can depend on it.

Under these circumstances, Andy Anderson's Jaguar coupe comes as a shock. Stock bodied in *legitimate* Concours trim including badge bar, contestants plaques and complete chrome tool kit, this heavy-weight blown coupe hauls. Firestone slicks are the only concession to convention and by the time 6000 rpm is reached in second, they're sizzling – it's Little Lord Fauntleroy with vitamins.

It's no accident that this 3000 pounds plus jewel ends the quarter mile traveling almost 100 mph. The leverage it exhibits is carefully built in and according to Anderson, the 215 hp it delivers to the rear wheels now is not to be the final figure.

In this never ending search to get more and more hp from less and less cubic inches, superchargers are getting a tremendous play. Anderson's coupe is an excellent example of a modified and blown engine that conservatives could hardly object to and even all-out racers will find interesting.

The original bore and stroke of the '55 engine was left unaltered (83 mm x 106 mm, 3.27 in. x 4.17 inches). The major rotating and reciprocating masses in the engine were carefully balanced both statically and dynamically. Included in this balancing were the clutch assembly and the blower drive pulley. In view of the intention to raise the maximum rpm limit to 6000 instead of the stock 5750 rpm, D type inserts were substituted for stock bearings. The higher revving D's use Indium coated lead-bronze shells.

The critical compression-pounds-boost ratio relationship was worked out on the assumption that the McCulloch was capable of sustaining a maximum six pounds boost with this 210 inch engine. This figure allowed the use of D-type nine to one pistons. Apparently, the choice leaves a bit of a safety margin, since detonation has never occurred.

This model was one of the earliest delivered in 1955. As such, it did not have the C type head fitted as original equipment. However, a wrecked C type supplied the desired head. With its 1.875-in. intake valves and 1.50-in. exhaust valves, the C head would normally bring about a 10% increase over stock (190 to 210 bhp). Before installation the head and manifold were carefully cleaned up and polished by Anderson, a locksmith by profession and not a stranger to hand tools. No attempt was made to alter the porting. The cams are an Iskendarian re-grind and sodium exhaust valves are used instead of the solid stem variety.

At the time the C head was purchased, the large bore 2-inch C carburetors were also acquired. A large venturi area can sometimes make itself felt adversely at small throttle openings under atmospheric induction. However, this does not apply to the same extent with supercharging. It's sometimes a little difficult to get *enough* area.

Ignition is stock except for the use of a Runbaken oil-coil.

The blower is the conventional McCulloch Jaguar installation. Belt driven with a heavy duty variable speed drive,

The tough arena of the dragstrip is the last place to expect a concourse-prepared Jaguar — but this is Little Lord Fauntleroy with vitamins.

it can deliver six pounds boost over quite a wide range of engine rpm's.

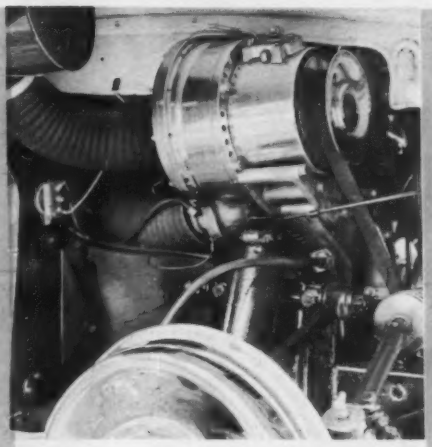
Air under pressure is delivered from the blower to the carburetor pressure box through a 2.125-in. steel cord reinforced neoprene tube. The pressure box, which completely encloses the two carburetors, is an aluminum casting. This pressure box effectively offsets one big disadvantage of having the blower ahead of the carburetors, that of inequalities in pressures between the inside and outside of these pressure sensitive units. Other than the fuel inlet line, which is a simple matter to seal, the throttle rod entry at the rear of the box is the only spot where trouble from leaks might conceivably arise. To make full boost immediately available, a manually operated switch allows Anderson to override the variable speed mechanism, locking it in the maximum output position.

In anticipation of heating difficulties a new radiator was fabricated using a four inch core. The stock Jaguar header tank and hose outlets were retained. The additional room taken up by the wider core and the blower drive pulley made it necessary to relocate the new radiator. This was done by advancing the bottom of the unit slightly and then raking it back at the top to keep it inside the hood and grille line. Slight alterations were necessary to the inner sides of the front fenders to make room for the advanced base of the core. The distance between the fan and the relocated radiator was felt to be critical. To overcome the possibility of overheating at a standstill or at low speeds, a shroud was fabricated of sheet metal to make sure the air displaced by the fan was drawn through the radiator core.

In spite of these precautions, overheating did occur. A slightly lean fuel mixture was found to be contributory. The altering of existing needles, since nothing standard proved suitable, was done on a lathe. Even the richer mixture failed to make the cure complete, so the cooling system underwent examination. A thermal engineer came up with the answer. Acknowledging the fact that efficient cooling is accomplished by making the greatest use of the coolant available, the flow of water through the head was restricted. It was believed that with the two inch entry into the head, the water circulated at such a rate that heat absorption from the head and heat loss in the radiator were both at a minimum. The determination of a head entry orifice of 1.25 inches was arrived at by a calculation involving the total area inside the head. In this case theory was borne out in practice. No further trouble with overheating has been experienced.

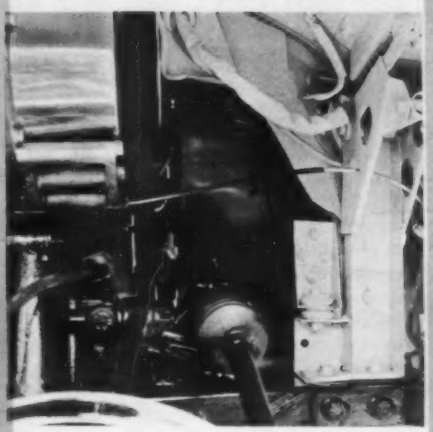
The exhaust system from the stock headers' back is dual, employing two straight through mufflers. The stock 3.54 rear end ratio is hardly the best suited for dragging, but still turns in times consistently between 98 and 100 mph. This is good enough to eat up most street sports coupes, including 300SL's.

With ten first in class or outright wins in West Coast Concours in the past year, Anderson can be justifiably proud of his car. In addition to this, he's got the perfect answer to the unwary one who comes up with that old question, "It's pretty, but does it go?".



Side panel was neatly cut out for unusual mounting of blower under fender. Variable drive pulley was drilled for balancing. Pressure gauge line is seen at exhaust port.

Reworked radiator with four inch core retained stock header tanks and hose connections. See how radiator is raked at top to keep it under hood line.



Relocation of radiator meant reworking the inner fenders to make room for the advanced radiator bottom. Fan shroud channels all air through radiator core.

Aluminum pressure box fits over carbs keeping pressure throughout the entire carb layout equal. In compartment are oil can, extinguisher, and extra plugs.

SCI CAPSULE ROAD TEST: MINOR 1000

Minor's compact size permits easy metropolitan parking yet can haul four passengers for short distances.

OVER THE past nine years the Morris Minor has been in outward appearance one of the most unchanging cars on the import scene. Stubby, somewhat plumpish and seemingly immorally high for its size, the smallest Cowley-built has looked the same except for minor trim changes since at least 1948. Under this ageless exterior however, great changes have been wrought over the years, some for the worse and some for the better.

When first brought into the U. S. in 1948, the car was one of Britain's top dollar earners. Two attributes were outstanding — fantastic road holding, and a gearbox that was sheer sensual pleasure to operate. Which last was a good thing for the car literally had to be rowed with the shift lever. Its engine packed only 48 very small cubic inches. What was there was willing enough but there just wasn't enough to do the job unless that shift lever was used judiciously. Along about 1954 the company was absorbed into the huge British Motors Corporation combine and the willing little flathead with its accompanying transmission was dumped in favor of the smallest of the Austin-based BMC engines and the gearbox which went with it. The less said about this particular combination the better; suffice it to say that it was sufficiently awful to cause the manufacturer to set about changing it with all speed. Design lead-time being what it is, the process brings us to 1957 and the Morris Minor 1000.

Had we not had some earlier experience with the previous types of Minor we might have been led to expect a miniature Grand Prix car in disguise from the raves that came from overseas and from enthusiastic distributors. We weren't having any, though. This was one car to be approached with an eye yellow with jaundice, having a mere two years before spent a miserable two hours wrestling with the interim gearbox.

At least until we got into the car. Still plumpish and high, it sat in the Hambro Corporation's garage looking like every other Minor ever built except for a redesigned grille. A pull at the starter knob set it buzzing happily to life with, strangely, a healthy, crackling but muted bark of exhaust. Then came the next of a string of very pleasant surprises — the gear lever slid into the first gate without a whisper. The clutch took hold with a smooth but solid bite and the car buzzed out into city traffic with a kitten-like pounce that was as satisfying as it was unexpected. Shifts from low to second, second to third and third to high were just as easy and quick.

Not only was the transmission changed but so was the power. The new 1000 engine is an entirely new casting with siamesed cylinders and a displacement of 948 cc, just short of 60 cubic inches, not a *huge* increase but enough to make an entirely different car out of the Minor. Combined with the fact that the original road holding owned by all Morris Minors has been retained, this added power makes the 1000 an amost ideal traffic vehicle. When a hole appears in traffic a quick downshift and a poke at the throttle puts you right into the space. You don't ease this car into anything, you jump it in.

Out on Connecticut's hilly Merritt Parkway another innovation, at least for Minors, showed up — no shifting even for steep hills. One member of SCI's test staff with a long and varied experience with Minors early and recent was happily motoring along, not paying much attention to the big speedometer. When he did glance at it he did a classic double take:

"Look," he said, "it says we're doing 70 miles an hour!"

He had reason to be startled. Earlier Minors had to strain their little insides to get an honest 60 mph on a dead level road. This one was cheerfully cruising up a mild grade at 70 and doing it so smoothly that it was hardly noticeable. Later, a series of timed runs showed an average 72 mph. In fact it went right up to that figure and no further both with and against a gentle wind. Conjectures about what another carburetor and a tuned exhaust would do immediately came to mind.

The brakes on the new Minor are more than equal to the job of handling the increased sizzle. Though some fade was noted, recovery was excellent and what fade there was didn't appear excessive. Handling is, as could be expected, superb if you like a light, quick and very positive steering and a readily provokable but controllable breakaway. Tire pressures influence handling on any car but on the Minor 1000 proper pressures (24 psi, front and 22 psi, rear) are vital. SCI's test car had a slow leak in one rear tire and when pressure dropped below 20 rear-end breakaway was instant and startling.

The Minor's behavior on bumpy, potholed roads must be experienced to be believed. On one horrible, short detour the car moved along at speeds 10 to 20 miles an hour faster than the other traffic with no feeling of jounce, or even any impression that it was being abused. On twisting back roads posted speed limits which in most cars seem entirely adequate seemed pitifully slow and unrealistic in the Minor 1000.

From the standpoint of encasing the human body, the Minor is a standout among small economy machinery. Headroom and legroom are more than adequate except for left arm space for large people over six feet when the window is closed. Even the back seat is roomy enough considering the size of the car. Weather sealing is good all around and wind noise is slight. Storage space is taken care of by *two* glove compartments and a trunk that, considering the car in question, is ballroom size. This is made all the more useable due to the spare tire being supplied with a hole of its own underneath the trunk.

All things considered, including a price just short of $1600, the new Morris 1000 should give certain of its competitors fits providing enough of them are produced to supply the demand which will be sure to follow.

— *jpc*

Trunk is actually two compartments, keeping luggage separate from spare tire and tools in bottom.

Engine, now up to 948 cc and with considerably more power, is as always readily accessible for service.

Dash panel has two glove boxes and a luggage shelf as well. Instrumentation is speedometer, 4 warning lights.

1957 MORRIS MINOR 1000

TOP SPEED:

Two-way average	72.0 mph
Fastest one-way run	72.0 mph

ACCELERATION:

From zero to	
30 mph	6.7
40 mph	11.0
50 mph	16.5
60 mph	25.7
Standing ¼ mile	22.9
Speed at end of quarter	57 mph

SPEED RANGES IN GEARS:

(1)	I	0-21
	II	2-34
	III	8-60
	IV	14-Top

SPEEDOMETER CORRECTION:

Indicated	Actual
30	29
40	39
50	50
60	60
70	68

FUEL CONSUMPTION:

Hard driving	30 mpg
Average driving (under 60 mph)	34 mpg

BRAKING EFFICIENCY

(10 successive emergency stops from 60 mph, just short of locking wheels):

1st stop	62	
2nd	62	
3rd	56	
4th	51	(Rear wheel lock)
5th	55	
6th	54	
7th	48	(Rear wheel lock)
8th	51	
9th	55	
10th	48	

POWER UNIT:

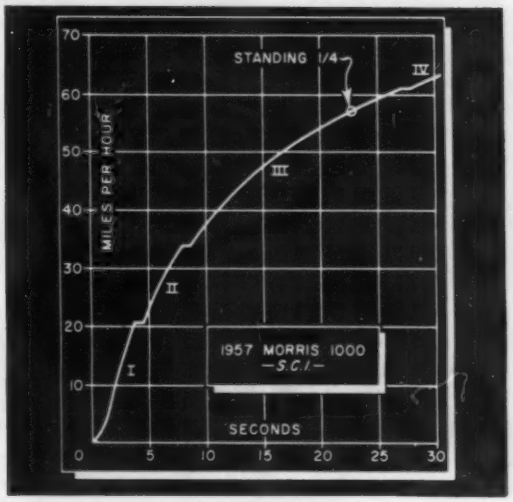
Type	4 in line
Valve Arrangement	OHV pushrods
Bore & Stoke (Engl. & Met.)	2.46 x 2.99 inc. (62.9 mm - 76.2 mm)
Bore/Stroke Ratio	1.2/1
Displacement (Engl. & Met.)	57.8 cu. in. (948 cc)
Compression Ratio	8.3/1
Carburetion by	Single SV
Max. bhp @ rpm	37 @ 4700
Idle Speed	700 rpm

CHASSIS:

Wheelbase	86 in.
Front Tread	50.5 in.
Rear Tread	50.2 in.
Suspension, front	Torsion bar
Suspension, rear	Springs
Shock absorbers	Armstrong
Steering type	Rack and pinion
Steering wheel turns L to L	2.5
Turning diameter	34.5 ft.
Brake type	1 LS Hydraulic
Brake lining area	63.8
Tire size	5.00-14

GENERAL:

Length	148 in.
Width	61 in.
Height	60 in.
Weight, test car	1736
Weight distribution, F/R	57/43
Fuel capacity — U. S. gallons	10



Minors have always handled well and added power of 1000 makes it even better. This one can be either driven or drifted through corners at will.

Lancia R. T.

(Continued from page 19)

ciency on the third of ten consecutive emergency stops from 60 mph the brakes were unaffected by continuous hard use.

Lancia undoubtedly could sell more cars by adopting a more razzle-dazzle styling policy and by making its products hotter. But both the acceleration and the speed of the Gran Turismo Aurelia are held to what the manufacturer evidently considers adequate levels – quite enough but not too much for average buyers of luxury sports cars. A significant point here is this engine's low speed torque. It lugs smoothly in top gear at idle rpms and will accelerate smoothly from that speed when the throttle is opened – the turbine effect again.

The V6 engine in 150 cu. in. form certainly is capable of much higher power output. The original Aurelia Spyder of 1955 was rated at 118 bhp at 5100 rpm and with 8 to one compression. Now the America has two dual-throat Weber carbs instead of one, has its compression upped to 8.4, pulls about 130 bhp at 5300. With a yield of only .87 bhp per cu. in this engine is nowhere near its potential; also it is very lightly stressed and should give unusually reliable, durable service, and this also is part of the Lancia tradition.

The provision of the second carburetor improves the two-seater's performance only in the upper rpm range where extra breathing ability becomes critical. Acceleration times from zero to 70 mph and over show marked improvement and about 5 secs. are lopped from the zero to 100 time. Top speed is increased by only a couple of mph but it must be pointed out that Robbie's engine was running lean during our tests.

Back in 1951 I asked the chief engineer of one of Detroit's Big Three for his opinion of the V6 engine. "Oh, we've checked that out," he said, "and rejected it. Unless you go the prohibitive cost of geared counterweights it's impossibly rough for the American market." Well, the six-throw, four-main crank of Lancia's V-6 has only integral counterweights, no vibration dampener and as we've said it's a model of smoothness. Authority isn't necessarily authoritative.

The whole engine weighs about 350 lbs.; block, sump and heads are light alloy, wet cylinder liners, valve seats and guides are cast iron. Vee-inclined overhead valves lie in a fore-and-aft plane instead of assuming the conventional athwartships position in the hemispherical combustion chambers. The camshaft rides in the block just above the crankshaft and actuates the valves through light alloy tubular pushrods, rockers and concentric valve springs.

Two ties with the vintage period are interesting. Like the Lancia Lambda of 1923 the Aurelia uses five rings per piston – three for compression and two for oil. This is in opposition to the general use today of three-ring pistons which swap reduced friction and wear for increased blow-by and crankcase contamination. The other carryover from the good old days is a set of thermostatically-operated radiator shutters. This feature is in addition to the conventional thermostatic valve within the cooling system and indicated Lancia's willingness to go all the way in its quest for doing things the right way.

At the rear of the engine is a small sheet metal housing which encloses the flywheel and starter ring gear. Aft of this is a light alloy coupling containing rubber pads, by which the drive shaft is joined to the output end of the engine. The drive shaft turns at engine speed, making it a source of undesirable vibration. By making it in two short lengths instead of one long one this defect is reduced. By using elastic couplings at all three joints and by providing a rubber-mounted self-aligning steady bearing at the center of the shaft it is eliminated.

The drive ,shaft is coupled to what Lancia calls the *"gruppo propulsore."* In one beautiful cast light alloy assembly are gathered the clutch, transmission, and final drive with its own oil pump for lubricating its contents. This arrangement has two main advantages. The absence of a transmission hump in the front floor panel makes for optimum foot room and moving this mass to the rear reduces loading of the front wheels. Rear suspension of the original Aurelia was by swing axles and coil springs but this was replaced by a de Dion layout using conventional leaf springs.

Huge brake drums are located on either side of the differential and the axle shafts are carried in sliding-nut couplings at their internal ends. These couplings are lubricated by oil carried in revolving casings which enclose the couplings. The half-shafts terminate in universal joints which are located *outside* of the rear wheels in order to hold U-joint deflection at a minimum, thereby reducing friction losses and wear. With this rear suspension there are none of the oversteer tendencies common to many full-independent systems. The rear propulsion unit is mounted on the body-frame structure but is perfectly insulated from it by rubber blocks.

Most cars that, like the Aurelia, are just one step removed from genuine racing machines have a certain truck-like brutishness: a heaviness in the gearbox or steering, a harsh clutch, a harsh ride and plenty of noise from various organs. The Lancia Aurelia, for all its uncompromising thoroughbred-ness, is not this way. Everything it does it does quietly but with total competence – and with style. Take the body, for example. The fit of the panels (steel except for aluminum hood and rear deck) is perfect. The doors, hood and lid function smoothly and crisply. They are among the little things that contribute to the overall aura of 24-karat quality and high style.

Compromise is the key word in judging the Lancia Aurelia for the single, remarkable reason that this is one of the world's few uncompromising cars. It is designed and built to the best standard its makers can conceive. When you study the question you wonder how so much art, care and engineering can be made to sell at such a modest price.

Griff Borgeson

Zephyr Conversion

(Continued from page 21)

is replaced by two separate cast iron exhaust manifolds, each collecting from three ports and discharging into its own downpipe to a Servais sound-absorbtion silencer. The upper faces of these manifolds are in contact with the bottoms of two square section wells formed in the floor of the intake gallery; functions of the wells are to act both as hotspots and traps for any liquid fuel that may invade the system as a result of over liberal use of the mixture control during warmups.

Both rows of valves are oversize and of nonstandard material. Head diameter of the inlets is 1.65 inches, exhausts 1.29. Steel for the former is to specification EN110, the latter EN59, a highly durable and heat resistant silicon chrome alloy. Port sections too are increased, and the 2H4 carburetors normally fitted have 1½ inch throats. A single spring per valve is retained but the strength is in excess of the Ford pattern.

The whole bottom end, including the camshaft, stays unmodified, but reciprocating weight in the valve gear is cut by replacing the solid pushrods with tubular ones. By compensatory design work the original rocker geometry is maintained in spite of the altered valve angle.

Experiment and development is in constant progress at Bourne, and already there are several embellishments on the basic conversion that can be specified. In the form outlined above, however, and with the regular compression ratio of 8.75 to 1, the Mays-treated Zephyr engine turns 127 bhp at 4750 rpm. Maximum torque in this trim is 153 lb/ft at 3000 rpm. Pending the establishment of U. S. agencies, Rubery Owen welcomes direct enquiries at Bourne. Pricewise, all that can be said at this writing is that in Britain the pack sells for the sterling equivalent of around $400.00. There is an additional installing charge in the U.K. approximating to $35.00 but detailed fitting instructions are supplied free and this isn't a job to daunt any average competent amateur mechanic.

Of the various measures used to boost output beyond the 127 horsepower level, all except one, viz., an optional compression ratio of 9.2 to 1, incur a surcharge of some kind. This high ratio, claimed to yield an extra 5 bhp, adds nothing to the price but calls for 100 octane gas. Wharton's car at Oulton Park, which was the makers' prototype, entered to whet public interest in advance of production, was running at 9.2 to 1 and had its exhaust pipes duplicated throughout their length, instead of only as far as the silencer. Figures to show the specific bhp value of dual flues are not available, but this system certainly talks your ear off at anything over half throttle.

Other price-inflating options are oversize carburetors (type 2H6 SUs with 1¾ inch throats), said to raise the power to 138 at 5000 rpm; and full race cams of evidently brutal characteristics—they con-

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Zephyr Conversion

(Continued from page 48)

tribute a further 18 horsepower, assert R.O.

As evidence of Rubery Owen's determination to persevere until a Zephyr engine finally blows up in their faces, we saw one of these mills on the test bench with three enormous dual-choke Weber carbs fitted. Assuming it also had the hot camshaft (the exercise was purely experimental and inquisitions were discouraged), this tinderbox might ultimately be expected to peak at well over 160 bhp.

Although obviously a radical improvement on Ford's conception of exhaust manifolding, the two cast iron collectors of the Mays conversion still fall short of racing practice as regards freedom of gas flow. So, in the course of our snoop around the test shop at Folkingham airfield, the Bourne outpost where most of Rubery Owen's proving work is done, it was interesting to come upon an authentic banana cluster exhaust system in Zephyr measurements. This comprised two fabricated assemblies instead of castings and was a model of delectably merging curvatures. Presently and in the forseeable future, it is not for sale.

Although relatively inexpensive, the Mays conversion hits a high standard of workmanship and finish. That isn't surprising when you consider that the man primarily responsible for it has for many years devoted nine tenths of his time to pure race projects, mostly conducted in a cost-no-object climate. He is Peter Berthon, head of the team that designed and is still developing Britain's fastest Formula I car, the 2½ litre BRM. (Experience fortunately suggests that the warmed up Ford doesn't share the BRM's mercurial temperament). Alfred Owen, millionaire head of the Rubery Owen industrial group, is also of course the cashbox of the Owen Racing Organization, which owns and operates the Grand Prix BRMs.

Using a converted Zephyr supplied by R.O., we have made a first-hand evaluation of this enterprising metamorphosis. The performance figures tell their own story, and a remarkable one it is. They nevertheless lose most of their significance unless related to statistics for the stock Zephyr, which has not been roadtested by *SCI*.

Startling as these figures seem, they come as no surprise to a driver who has tried both stock and converted Fords. The Raymond Mays treatment literally transforms the car, giving it a bounding exuberence that lifts it way out of the ruck of English sedans in the 2 to 3 liters bracket.

The Mays setup on the test car differed from standard in having the larger (2H6) carburetors, which are reckoned to be worth 11 bhp extra. Rubery Owen states, however, that this gain comes at the top end of the power range, the torque low down being if anything inferior. This seems to be corroborated by the facts that our maximum speed was up by about two mph on a contemporary's findings with the smaller SUs, whereas all our acceleration figures were down by assorted nuances.

The car on test was also fitted with Borg Warner semiautomatic overdrive, which is one of Dagenham's transmission options. This particular B.W. application is engineered to make its up-shifts at 31 mph, whether out of low, second or high; so, as 31 mph is exceedable in low, it follows that six ratios are on call, which in theory should lend the thing wings in timed acceleration tests. In practice, though, it doesn't work that way, due to the measured pause punctuating the shifts. After timing runs with and without benefit of Borg Warner we came to the conclusion that two mauling manual changes, and just that, incurred a smaller penalty than the alternative, in spite of the wide spacings involved.

Normal high on the test car was 4.1 to 1, giving 17.6 mph per 1000 rpm. Corresponding speed on overdrive high was 25.2 mph, from which it will be deduced, and rightly, (a) that overdrive adds a lot to restfulness when cruising fast and far, and (b) that maximum speed in this ratio, except with a following wind or going downhill, falls short of direct top maximum.

There is a connection, incidentally, between the B.W. overdrive and the retention of single valve springs in this conversion. Although the Mays job, with big carbs as tested, reaches its power peak 800 rpm further up the scale than a stock Zephyr, the former makes it plain that it would rev faster still, and like it, if its valve springs would let it. At or around a corrected 60 mph in second, for instance, the valve gear quite suddenly starts yammering like a ruptured fairy. We commented on this to a Rubery Owen luminary and were told that the decision to stick to single springs had been partly dictated by isolated cases of a hamfooted driver inadvertently going beyond the full throttle travel and kicking himself out of overdrive when making say 80 per in o/d second, or some unprintable speed downhill in o/d high. When this happened, double springs broke up but single ones didn't. Presumably the range of bounce allowed by single springs is insufficient to cause piston/valve collisions.

Our test itinerary being much curtailed by fuel rationing, it wasn't possible to get separate sets of mpg figures for hard *and* average driving over significant mileages: by the time we were through driving hard, it was time to stop driving at all. All we can add to the solitary consumption return shown in the table, therefore, is that Rubery Owen claims that the conversion with big bore carburetors gives approximately the same mpg as the stock Zephyr at equivalent speeds and goes slightly further per gallon when using the 1½ inch carbs.

In every other aspect of behaviour the converted engine is in our opinion either equal to or better than its standard counterpart. It starts instantly, whether cold or when freshly switched off after serial full-bore acceleration bursts; it idles sweetly and regularly, hot or cold; the level of mechanical noise, except when valve yammer is allowed to develop, is moderate—certainly no worse than the iron head job; most important of all, this is, for its displacement, a flexible engine with good pulling power at low to medium turnover. In common with the unmolested version, it gives very easy access to all departments liable to need periodic attention—carburetors, spark plugs, tappets, distributor, etc. The alloy head itself is 28 pounds lighter than the normal one, but the extra weight of such items as the cast iron exhaust manifolds, two carbs and air cleaners instead of one, and so forth, pretty well restores the status quo.

Exhaust noise from the basic Raymond Mays system, using a single tailpipe, is surprisingly subdued, scarcely louder than with Dagenham's own plumbing and far lower output.

Ford of England, in common with Vauxhall, the only other British marque with American affiliations, persist in the un-English practice of omitting a fourth ratio from their gearbox. No doubt a proportion, maybe a majority, of the R.M.-converted Zephyrs and Zodiacs that ultimately go into service in the U. S. will be fitted with Borg Warner overdrive, and thus have six speeds on call. However, having driven the loaned car with its overdrive locked out of action for more than half of our test mileage, we can fairly evaluate the combination of a manual three-speed transmission with the engine characteristics that the Mays recipe produces. On average British roads and in typical British traffic densities, which dictate a more fitful motoring tempo than most U. S. drivers are accustomed to, a three-speeder labors under an inherent handicap—unless its engine has really useful mid-range torque. This the R.M. Zephyr certainly does have, which very largely compensates for the absence of a fourth cog.

The point can be illustrated by comparisons with another British sedan of roughly equal displacement that SCI has roadtested. The 2.4 Jaguar, with four speeds and a handier and more positive acting gearshift, is 2.2 seconds slower than the Ford from zero to 70 mph.

With a gap of 2.3 ratios between second and high in the Ford drive train, it could be forgiven if up-shifts between these stages produced momentary power doldrums. In practice they don't. On the contrary, when the revs are taken to the brink of valve bounce in second, top comes in with a vigor that leaves a brief wheelspin smudge on dry concrete.

The shift itself, of course, is on the steering post, and, as these devices go, it isn't at all bad. Its range of travel is reasonable, and the synchromesh on second and third works well and isn't all the time panting "Hey, wait for me."

For customers who feel that the non-standard performance of the converted Zep calls for non-standard aids to safety and road holding, Rubery Owen offers, at extra cost, harder brake linings and heavier duty Armstrong dampers for the back springs. *SCI's* test car had the latter (which Armstrong has engineered in consultation with R.O. specially for this car), but not the former. As our braking efficiency percentages show the normal linings stood up pretty well to *SCI's* regular gruel of ten hard stops from sixty in rapid succession. Pedal pressures were reasonable but the last few detentions produced unavoidable locking of one rear wheel or the other.

If it is true — which it isn't literally, of course — that the R. M. Zephyr "handles

like a Formula I car," much of the credit belongs to the stringent damping at the rear end. It's remarkable how far this single suspension adjunct goes towards imparting sports car feel and cornering characteristics to what is normally a billowy and, by European standards, roll prone family conveyance. Earlier experience on a Zephyr with original pattern shocks had shown that with no center armrest to keep the driver and his neighbor apart on left-hand corners (the car had righthand steering, of course), the latter was apt to become the plaything of transverse G and wind up literally in the conductor's lap. This apparently was the price that had to be paid for a very comfortable ride in a straight line and over bad surfaces. The R. M. Zephyr too lacks a center armrest, but it is hardly missed. The supplementary damping puts lateral stability onto an entirely different plane and, by preventing an exaggerated angle of lean on turns, indirectly improves cornering power very markedly.

At any speed within its scope, this Ford holds a true course during straight running, answering the helm in a consistently predictable way, even if the steering linkages do convey a hint of the prevailing modern flaccidity. The same as in unmodified form, there is an acceptable trace of understeer. Three turns of the wheel winch her from lock to lock, which isn't excessive, but the turning diameter of 36 feet is too big for maximum convenience in the tight maneuvers demanded by rally tests. A rally man with the Mays appurtenances under his hood has the answer to that problem, though: he can use his power bonus to steer through the back wheels.

Dennis May

"And all he wanted to do was get an American car."

Last Mille Miglia?

(Continued from page 29)

class vaporized. All things considered, then, Moss was the favorite on the basis of past performances and on the basis of the 4.5's fine showing at Sebring. The young Englishman was talking about having a "go" at his '55 record of a 97.9 mph average in the Mercedes 300SLR, but this seemed a super-human task considering the diffrence between Italian and German pit work. The new Maserati has more acceleration than the Mercedes and it had been fitted with an additional two-speed transfer case mounted just behind the engine with a "high" and "low" cog to gear the car down for the mountains as well as give it an additional 15 mph on the long straight stretches. (As a point of interest here, Moss said after he got back into Brescia that the Maser reached its maximum speed just after leaving Brescia, whereas in the Mercedes, they didn't get the thing up to its limit until close to Verona, 41 miles out).

Another point in Moss' favor was the fact that he had drawn the final starting number, so as you move out you always know where you stand in relation to your competition while they never know how close behind them you are until picked up in their mirror. As far as top speed was concerned the Ferraris and the 4.5 Maser were on equal terms—an honest 185 mph for both with the Maser having an edge with its extra box. Ak figured he could turn 170 mph on the long straight back into Brescia from Mantova, as the surface was new and smooth, but for the rest of it he couldn't possibly exceed 150.

That night, Brescia was really jumping. The first car, a baby Fiat, rolled down the ramp at 11:00 pm, and at succeeding intervals of one minute a piece 301 starters were flagged off.

At 3:49 am, Umberto Maglioli roared off into the night in the Porsche; at exactly the same time, Ak and Doug were eating breakfast in their hotel and preparing to bring El Caballo to the starting line. They walked to the garage, rolled her out of the stall and turned over the starter; nothing happened. Again they tried—again—still nothing. A Fiat was enlisted to tow the race car around the garage which, incidentally, was two stories underground. Finally, at about five am, just 24 minutes before they were due to be off, El Caballo decided to cooperate and fired up. The two Americans, usually the picture of relaxed composure, were spitting nails by the time they pushed their way through the milling crowds at the starting line.

Flockhart's Jag went down the chute at 5:18. The Cooper-Jag of Steed and Hall set off at 5:20, then came Ak's turn. The powerful Chrysler motored calmly up to the line on the ramp where Castegneto and Count Magi with the mayor of Brescia stood with the starting flag. It was fantastically exciting; the impressive Chrysler

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Horses Part II

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through a single throttle valve, but instead of trying to measure air density by a combination of temperature and pressure, they put a big venturi at that throttle and bled off a pressure line which was directly sensitive to the volume of air being consumed. This told the injection pump exactly what it needed to know, and avoided seasons of cut-and-try between races.

Mercedes also seems to have licked the knotty problem of nozzle placement in a unique manner. Their outlet was screwed into the cylinder wall just below the intake valve, where it was covered by the top land of the piston at top dead center. Its spray was directed across the incoming air stream, to improve vaporization, and against the face of the exhaust valve to cool that hot surface. Injection was timed to take place over the 120 degrees before the piston covered the nozzle, which meant that fuel entered largely during the compression stroke and was still being injected as combustion began if the ignition was well advanced. This kept the fuel-air mixture as cool as possible up to the last minute, and allowed complete freedom in valve overlap since fuel couldn't be lost down the exhaust pipes.

The remarkable smoothness and power of the Merk straight-eights at all speeds is testament enough to the potency of this injection system, which rounded out every flat spot. Unless the job's done just right, though, the curve will be full of lumps and a handful of Webers or Solexes would be a better investment. The major problem, as we recall, is the passage of the maximum weight of air per unit time, equalled in importance by precise fuel metering. Pounds of air that can be pumped through depend on all the foregoing factors but probably most of all on valve timing, which is more closely intertwined than ever with compression ratios and combustion chamber design.

VALVE GEAR

If the racing engine designer could have his way, his valves would open instantly and close just as fast. He's constantly pushing back the barriers of material strengths and space restrictions to approach this goal, and direct injection has helped by eliminating some of the variables in the overlap period. It has hindered just as much, though, by allowing higher compression ratios which severely limit the piston-to-valve clearance margin at top dead center. Those valves *must* be seated fast, or risk summary decapitation.

As hinted above, there are many limitations on both positive and negative valve acceleration. Kicking the valve open is by no means as tough as closing it, but the first step can directly influence the ease with which the second is executed. If durability of the valve gear isn't important, the opening contour can be quite arbitrary, but for long life the cam shape must be matched to the tappet type, shape and material, the spring pressures and the weight of the components to be lifted.

Converting the rotating motion of the cam into the valve's reciprocation motion introduces some side thrust at the junction point, and to keep this from wearing the valve guides unduly, some form of tappet must be interposed. The shapes of the tappet faces determine the actual motion of the valve as opposed to the plotted cam lobe. A cam for a roller tappet, for example, will look more extreme than that for a flat tappet giving the same valve opening diagram.

In spite of this, a round or curved tappet surface allows the cam designer much more latitude, and the roller is the ultimate development of this. There has been much discussion over whether or not they actually roll, and in Ricardo's day there was reason to doubt it, but Chet Herbert's modern experiments show that they do rotate. This is beside the point, though, the function of the roller being to allow an improved valve opening diagram, which must be enough better to offset the added weight that the use of a roller brings.

With a few notable exceptions, most of the world's top racing engines have used a finger-type tappet. This is a short, shaped sliver of metal placed between the cam lobe and valve stem, with one end pivoted so that the finger trails in the direction of the cam rotation. (It can actually be either direction.) All lateral thrust is thus taken by the pivot bearing, and the finger can be as thin and light as the designer dares, once he's presented the cam with the type of tappet contour that it requires.

Actual pivoting methods vary, but Maserati is typical in using a single shaft parallel to each cam. Porsche, with only two fingers per cam to deal with, rests the finger anchor on a spherical surface, supported by a vertical rod. The fingers themselves can be shifted, sometimes by eccentric pivots, to vary valve clearance, though most rely on tiny cups with shims over the valve stems, if they aren't finicky enough to grind the stem ends to suit.

More accurately called a "tappet" are the cup-type cam followers long familiar to Meyer-Drake mechanics. Both huskier and heavier than valve fingers, this type has been popularized in production engines from Jaguar, Aston-Martin and Alfa Romeo, not to mention the Crosley. All have valve adjustment by shims, the latter being the only version in which shims can be changed without pulling the cam.

Cup-type tappets aren't generally suitable for assaults on the two horse per cubic inch mark, since their working surfaces must be flat or nearly so, which restricts the cam designer. Liking the straight motion of the cup-type, though, Lampredi produced a mushroom-shaped variation of it for his Ferrari fours. He sank a narrow roller into its face, though, to allow faster valve accelerations, and his successor Bellentani has added rollers to the tips of the rockers in the single-cam V-12's. Even the finger-type followers are getting the treatment, the latest Maserati engines having rollers added, plus screw-and-locknut clearance setting. They may find it hard, with this system, to keep the roller surfaces

parallel to the cam face under heavy stress.

Don't think, also, that the stresses are anything but heavy. Kicking the valve up at present-day acceleration rates produces a pretty heavy jolt, and bringing it back down rapidly calls for valve spring pressures in the 280-300 pound region. Finding room for such springs has always been tough, if the weight of the reciprocating valve gear is to be kept down. One big help has been the hairpin or "mousetrap" valve spring, which finds its origins in motorcycle practice, like so many high-output features. Like torsion-bar valve springs, these are virtually free of heavy "surge" periods, and several can be installed without increasing valve stem length. Coil springs alone can also be used, but at least three per valve are usually needed.

Loads can be lessened, of course, by lightening the valves; just talk to any BRM designer about that! The first BRM taught us that wet liners and detachable heads didn't go too well with a 70 pound boost pressure, and the second one has shown that, with present materials, you can't have a huge valve and a light valve at the same time. With a valve head diameter of roughly 2¼ inches on the intakes of their way-over-square four cylinder, adequate strength could only be obtained by making the valve so heavy that the increased loadings held the top revs down and cut power. Very frustrating, but full justification for the first layouts, which gave each cylinder four valves.

One of the best routes when trying to run a big-bore engine at high speeds, with the valve area necessary, is to use more and smaller valves. The individual cam and spring load is literally slashed, allowing much higher revs with mechanical complacency. There will be slightly higher fluid friction losses at the ports, due to the relatively smaller size, but this can be minimized.

Ricardo, that keen student of design "correctness," thus had good reason to fit a four-valve head to his 180-inch four cylinder Vauxhall. The big Offys, of course, are a classic example also, as were all the Mercedes GP cars of the thirties. A link over the war period is provided in Europe by the 4CL and 4CLT Maseratis, and today there is a 2½ liter unblown four under development at the Orsi Maserati firm, using 16 valves in classic pent-roof chambers. Keeping up the German tradition are Borgward, with their 16-valve 1½ liter four. Englishman Leslie Brooke heard the message, and effected a compromise in his GP V-8 design, which has two intake valves and one exhaust per cylinder.

Not satisfied by the good characteristics achieved by using four valves, Ricardo wanted still better valve accelerations without resorting to brutal valve springs. His solution was typically clever, and may be in use on some modern engines. He simply countersunk the intake valve seats a fraction of an inch, so that during the first small portion of their upward travel they were still effectively closed. Then, when they "broke the surface," the valves were already accelerating at a good rate, and later came down quickly in the same way. Using very long nominal duration periods

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Horses Part II

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and moderate ramping with mild springs, some quite hairy opening diagrams can be recorded this way.

Faced, in 1954, with a GP formula in which only unblown engines had a look-in, the Mercedes engineers realized that valve timing would have to be taken much more seriously than in the past. As mentioned earlier, also, the use of fuel injection meant that compression ratios could rise, which in turn would mean that there'd be much less space at the top end for floating valves to wander around in. They also wanted big valve area, without the port restriction of the old four-valvers. The only answer was to make the valve motion independent of valve gear weight and the whims of springs, so they set about developing a positively-closed poppet system.

Coined "desmodromic," the Mercedes device was the first practical manifestation of a long-cherished concept. To each valve they gave two cams, side-by-side on the same shaft. One, looking quite normal, opens the valve via a conventional tappet. The other cam is literally up wherever the opening cam is down, and presses a pivoted lever which pulls the stem up at the proper time, being notched into a necked section. Between them the two cams put the valve just where it's wanted at all times, which was a great relief to Uhlenhaut, Neubauer and Fangio, among others. *(For details see Sports Cars Illustrated, May 1957)*

With this under their belt, the M196 engineers could turn loose some formidable figures, one result being that the valves were seated just 228 per cent faster than the heaviest practical springs would allow. In fact, Uhlenhaut said, spring pressures of *1000 pounds per valve* would be needed to duplicate their speeds.

Desmodromic actuation is yet another valuable Mercedes feature which few have been able to adapt to their own purposes. This is for the very good reason that it's a complex, finicky and expensive devil to make, even for Daimler-Benz. Knowing that the stroked 300SLR engine wouldn't be capable of the same revolutions as the GP powerplant, they tried to save themselves some trouble by using ordinary springs on the prototypes. It worked, but the safety factor given by the positive rig was too inviting to pass up.

Only other firm to progress along this line is Osca. The Maserati brothers have done extensive testing with a valve gear very much like that of Mercedes, with the addition of rollers on the tips of the valve closing levers. Their method of clearance adjustment is different, as is their valve opening tappet. When this is going it may restore Osca to the Class F championship.

Even with the intake and valve gear problems solved, two horses per inch are far away unless the combustion chamber, exhaust and mechanical layouts are right. In the next and final installment we take up these important aspects of racing engine design.

—Karl Ludvigsen

Corvette

(Continued from page 37)

retired the car at Sebring. Rubber bushings are suspect in a suspension anyway, if very good steering is the goal, and one of them here did shift and destroy the alignment. Since this didn't show up on the much-flogged "Mule" it could well have been a material fault.

Springing at all four corners is by coil-shock units. The long small-diameter coils are carried in cups attached to the body of the tubular shock and its piston rod, giving a quickly demountable unit with a built-in bump stop. Rebound is limited by fabric straps. At first there was an additional housing around the coil, but this was tossed out to cut weight and allow quick access.

Probably the highlight of engine development on the SS was the use of aluminum cylinder heads for the basically stock 283 inch engine. These heads are very similar in design to the stock part, with only a slight repositioning of the intake ports to take advantage of some Weslake gas flow theories. They are definitely designed and run *without valve seat inserts*. Using the stock valve spring pressure of 210 pounds open and the slightly tuliped valves of the SS, pounding-in of the seats was very slightly more than normal, but not enough to cause any concern at all. If this technique can be reproduced, it could open up a brand new field in special heads for OHV engines. Only major structural change to accommodate the heads is the use of necked-down studs to compensate for the greater expansion of aluminum.

At Sebring it seemed that cooling troubles could be blamed on poor head gasket sealing, but it now looks like a subcontractor was to blame. Construction of the remote-mounted radiator header tank was farmed out, and a flow-control baffle was so misplaced that it cut off two thirds of the planned circulation. The tanks were peeled open and the baffles put in right. After that the ducted aluminum radiator performed as expected, as did the oil cooler incorporated in its base.

To the left of the radiator a Fiberglas duct scooped cool air into the Rochester injector machinery. The big air metering valve was faced forward instead of sideways to simplify the ducts and throttle control as much as possible. This injector requires a small air bleed to each nozzle for vaporization and idling, which is usually supplied by small pipes from the air cleaner. In this case there's a tiny individual filter for each adjacent pair of nozzles.

More important, nozzles for Chevrolet injection are now being built by the Diesel Equipment Division of GM, and are improved in two ways. First, the all-important nozzle size is determined by a thin calibrated disc instead of a lengthy sized hole, giving benefits in accuracy of distribution (which is still not so good with this system as it might be). Nozzle jet size is now .0135 inch instead of .0110. Second, each nozzle now incorporates a filter screen in addition to that at the pump. This has just

about eliminated the chance of stoppage.

We weren't alone in wondering about the flex cable drive to the injection pump, *(SCI June 1957)* but this has been reliable except when the pump begins to jam, in which case the drive goes out before major damage is done.

The clutch and four-speed box are regular Corvette units, with the exception of the alloy housings that we mentioned, and the drive shaft is open with two universals. A late-model Halibrand center section houses a straddle-mounted pinion, helical quick-change gears and a Chev "Positraction" differential. Torque goes from here to the wheels through open axles with Hooke-type universals and sliding splined joints.

Since the differential is hung solidly from the spring support cross tube, it's tempting to mount the brakes inboard too and reduce unsprung weight. Duntov succumbed to this, as have many other designers, but Aston-Martin gave up this layout in 1953 for the good reason that heat from the brakes gets the differential hot, and vice-versa. It's not surprising that the same trouble is cropping up with the SS, but it can probably be licked by much better air venting down there. Additional scoops at the front end duct cooling air down into funnels attached to the backing plates.

As we've mentioned it was expedient to use two-leading-shoe Chrysler Center-Plane mechanisms to get brakes of the proper size and type in a hurry. GM devised their own drum design, though, which has also turned up on another Corporation product. The drums have a cast iron face and working internal surface, plus an aluminum finned muff which is locked mechanically to the outside of the working surface. 120 small holes are punched through the periphery of each drum, and when aluminum is cast around this it fills the holes and becomes a mechanical part of the cast iron. You can see also that the resulting internal drum surface will be dotted with little aluminum spots which can carry heat right out to the fins without passing through the iron at all! It's simple — almost crude — but it seems to work. Biggest danger is possible heat spotting from insufficient drum stiffness and uneven expansion.

These drums are 12 inches in diameter and 2½ inches wide. It was just recently announced that the Buick "75" for 1957 will be equipped with aluminum-finned drums of exactly this construction on the front wheels only, which have just the same drum dimensions. There's no reason to believe that it isn't the same part. So, if you'd like SS Corvette brake drums for your Chrysler, De Soto or '56 D500, go bang on the door of your Buick dealer!

Also interesting is the front/rear brake proportioning device used on all the Sebring Corvettes. This depends on two vacuum servo cylinders, mounted in the rear with the lightweight battery for convenience. The simple cowl-mounted master cylinder has a direct hydraulic connection to the right-hand servo cylinder, which in turn power-brakes the two front wheels directly. This requires two chassis-length hydraulic lines which are coil-wrapped for protection. In any case, then, the front wheel braking will always be proportional to pedal pressure, and will still be there if the vacuum fails.

Now, the hydraulic output of the left-hand servo cylinder is piped straight to the rear brakes, but the vacuum section is so linked to that for the front wheels that the two operate sympathetically. In other words, front brake force is directly controlled by the pedal, and rear braking is proportional to that at the front due to an air link between the respective vacuum cylinders. The basic front/rear proportion for the SS was set at 70/30.

Okay so far. The air pipe that connects the two vacuum cylinders can be sealed off by actuating an electric valve—undoubtedly a solenoid—which leaves the cylinder for the rear wheels completely isolated in whatever position it was when the valve closed. The electrical impulse is released by a mercury switch, mounted in the cockpit where it's handy. This switch is angled forward so that the mercury will slide up toward the end a given distance for a given quantity of car deceleration. When the mercury hits the end, in a stop of a preset negative "g", the solenoid is closed and rear braking force stays just as it was then— it can't increase; it doesn't go down. Front wheel force can then continue to rise in proportion to pedal pressure, but it's absolutely impossible to lock up the rear wheels no matter how hard you try! They're isolated from the circuit until the mercury switch and the valve open up again. With that mercury switch at just the right angle, braking at all four wheels can be fully used much more often than at present, when ultimate deceleration is limited by rear wheel locking. The switch angle could also be changed during a race to compensate for wet roads or different surfaces, or changing fuel loads. We've ridden in a car equipped with this rig, and think it's very promising.

If it gives more devices like these a try-out, the SS Corvette will be well justified as a rolling test-bed. Testing at Sebring before, during and after the race turned up a few basic faults in the SS' layout that are now being reworked. One, of course, was the extreme heat in the driver's compartment. To relieve this the front and rear pipes in the exhaust manifolds are being brought closer to the center pair, to pull the rear pipe away from the firewall. The pipes also curve more quickly to the outside of the magnesium body.

This manifolding, by the way, gave a big boost in power. The compression ratio on a competition version of the Chev V-8 had to be taken to 11/1 to get 310 horses, while the SS delivers the same amount on a 9/1 ratio with this exhaust.

On the bright side, there now exist three SS tube frames in addition to the "Mule" and the race car—a total of five possible machines. There are still a lot of guys at Chevrolet that believe in the SS and what it can do, and there's always a chance that Chevys will sell better in '58! Let's hope so, because this one is too good to be sent to the showers so early in the game.

—Karl Ludvigsen

under the hood

BONNEVILLE NATIONAL SPEED TRIALS

Aug. 26 to Sept. 1, 1957

The Contest Board of the world-famous Bonneville National Speed Trials has just announced regulations for the ninth edition of this classic event. Due in part to encouragement given by SCI, this year's week-long meeting on the world's greatest and safest straightaway course will offer greatly increased scope for sports car competition. In place of the four sports classes provided at previous Bonneville meets. The '57 rules define ten classes of sports cars. Last year's meet was enthusiastically endorsed by *all* its sports car contestants and the Board extends a warm and cordial invitation to all those who wish to run in sports car categories this fall.

Whether you'd like to scream for records in a blown Monza or just explore the effects of simple tuning on an MGA, you'll find running on *the* land speed record course an unforgettable experience. The Nationals are justly renowned for smooth organization, precise timing, safety, technical stimulation and good fellowship. The $20 entry fee ($35 post-entry, after Aug. 1) entitles contestants to any number of timed runs during the seven-day event and there will be excellent trophies for top cars in classes.

REGULATIONS

I.

Sports cars will be divided into four groups with separate engine classes as follows: (Production will mean produced in quantities of 500 or more; open and closed cars will run in the same classes.)

SPORTS CARS, PRODUCTION

Class O: Up to 91 cu. ins.

Class A: 92 to 170 cu. ins.

Class B: 171 to 305 cu. ins.

Cars competing in these classes must be equipped with production sports-car type bodies, unaltered in height, width and contour. Engines, bodies, chassis, windshields, fenders, hood and grille must be of the same year and make and mounted in the conventional manner. No streamlining will be allowed.

SPORTS CARS, AMERICAN PRODUCTION

Class C: Up to 368 cu. ins.

Cars competing in this class must be equipped with American production sports car type bodies, unaltered in height, width, and contour. Engines, bodies, chassis, windshields, fenders, hoods and grilles must be of the same year and make and mounted in the conventional manner. No streamlining will be allowed. American production sports cars with engines above 368 cu. ins. will run in Class CM.

SPORTS CARS, MODIFIED

Class OM: Up to 91 cu. ins.

Class AM: 92 to 183 cu. ins.

Class BM: 184 to 305 cu. ins.

Class DM: 306 to 488 cu. ins.

Cars competing in these classes must be equipped with sports car type bodies, either modified production or fabricated. Supercharged engines will be limited to 368 cu. ins.

SPORTS CARS, AMERICAN MODIFIED

Class CM: Up to 425 cu. ins.

Cars competing in this class must be equipped with American production sports car type bodies which have been modified or streamlined. Engine make is optional.

ADDITIONAL REGULATIONS

II.

All sports cars, in addition to the general safety and technical regulations, must comply with the following rules:

S1: Suitable for competition. Cars entering for sports car classes will be qualified as per the 1957 FIA Sporting Code.

S2: Fuel. All cars must run pump gasoline without any type of additive.

S3: Bodies. Minimum width 48 inches; must have two functional seats side by side.

S4: Doors. All cars must have at least one functional side door.

S5: Fenders. These must be securely mounted and must cover tread of tire for 120 degrees, down to a point on the rear tire no higher than a horizontal plane through the rear axle. Cycle-type fenders will not be permitted except where factory production.

S6: Windshields. These are required on production classes, American production class, and American modified class.

S7: Exhaust systems. These may be modified.

S8: Only single-engine chassis will be allowed.

Misc.: Cars must have battery-operated starter, positive-operated generator, headlights, tail lights, horn, spare tire. Quick-change and locked rear ends will be allowed.

For entry blanks or further information write to Mr. Jim Khougaz, Secretary-Treasurer, Bonneville National Speed Trials, 20304 Gresham St., Canoga Park, Calif.

Last Mille Miglia?

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sitting there, turning over relatively quietly in comparison to some of the other iron already gone, all white with a bit of blue showing—Doug and Ak looking like two jet pilots—the mob of Italian photographers on a platform over our heads shouting themselves crazy to get Ak's attention. Seat belts adjusted, shoulder harnesses set, the seconds were counted out and the flag fell; every American present felt a wonderful pride in that machine as Ak let in the clutch—easily—to avoid going down the ramp too quickly and banging the car's rear as they hit the street. With all four wheels on black top, Ak really poured it on, and away they went, a white and blue bomb passing between a mass of waving, cheering humanity that opened like a wave as they roared through. Moss was off at 5:37, preceded by the Ferraris of de Portago, Collins, Taruffi and Von Tripps. We returned to the press office to follow the race from there.

Within 5 minutes the Maserati threat had completely dissolved. Moss, boring through a 140 mile-an-hour corner just seven and a half miles out of Brescia, shifted down into fourth, hit the brakes, and nothing happened. His foot went clear to the floor, the pedal itself breaking off on the stem, metal failure. Stirling's guardian angel must have been on duty at that moment for if the incident had occurred a minute or two before, he wouldn't be alive to tell about it. Bitterly frustrated and disappointed, Moss and Jenkinson got the Maserati to a halt safely, and with the help of some peasants, turned her around and headed back to Brescia. Even if the pedal could have been replaced or repaired on the spot, the fact that they had started last meant that any delay would make it impossible for them to get back into the race as the road would be jammed with the public—minutes after the time they were to have passed. Hermann's new V-12 didn't last much longer. In true Maserati form, the car had been finished the day before without any opportunity to try it out on the road; Hans managed to get a bit of highway time in but nowhere near enough; its handling just wasn't right and he retired near Ferrara. This left only Scarlatti in the 3 liter six cylinder to uphold Maserati's honor.

Collins in his Ferrari was burning up the roads; the new quadruple cam 4 liter twelve averaging 118.4 mph to Verona. Then as the road reached Padua and turned South for the run along the Adriatic Coast, Taruffi put his foot in it. Running as if at Le Mans or Monza, he flew South towards Ferrara, Ravenna and Pescara—here there are numerous blind hills; the man who knows which way the road goes—which ones can be taken at full throttle, is well ahead of his competitors; Tripps was in the lead, but not for long; he was first at the Ravenna control averaging 115.7 mph., Collins just 36 seconds behind him and Taruffi just one minute and 20 secs. behind him. By Rimini, 37 miles farther on, Taruffi had made up this minute and 20 seconds, passed Tripps and by the

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Plymouth Fury R.T.

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From standing at idle to sprinting full-bore the Fury is a very quiet car. The engine is surprisingly silent in spite of mechanical valve lifters and a rather wild cam that nevertheless provides a silk-smooth idle at 500 rpm. Some characteristics of the standard and Fury cams are:

		Std.	Fury
Intake opens	BTC	8°	17°
Intake closes	ABC	52°	59°
Exhaust opens	BBC	52°	55°
Exhaust closes	ATC	8°	21°
Lift, intake & exhaust		.387	.405

Unlike other Plymouth engines, the Fury is equipped with a crankshaft vibration damper which plays an important part in the general effect of smoothness.

The standard Plymouth V8 engine has a 3.13 inch stroke and 301 cubic inch displacement. The Fury uses a crankshaft from one of Chrysler's Canadian lines having a stroke of 3.31 inches and giving a swept volume of 318 cubes. Other Fury parts are twin four-barrel carbs, the camshaft and vibration damper just described, stiffer valve springs, high compression pistons (Fury's c/r is 9.25 and standard is 8.5), special dual-breaker distributor, and a heavy duty clutch. While the standard Plymouth has a single exhaust system with 2.25-inch main pipe and 2-in. tail pipe, the Fury has a dual setup with 1.875-inch main pipes and 2-in. tail pipes. While the advertised bhp and torque figures for other Plymouth models are based on 98 octane (research method) fuel, the Fury's are based on 105-octane *kraftstoff*.

The Fury engine is optionally available on many other Plymouth models: the Plaza, Savoy, and Belvedere V8's. This will appeal to many buyers because the Fury model is loaded with extra bric-a-brac, all of which must be paid for. With the V-800 engine option the other Plymouth models come equipped with the police-and-taxi heavy duty suspension components and wheels with six-in. rims all included in the price of $245. While the stick-shift Fury is normally fitted with 3.54 final drive gears and the automatic trans with 3.36's, a huge range of options is available: 3.18, 3.73, 3.9, 4.1, and 4.3. Also on tap as special export ratios (for the Himalayas?) are 4.56 and 4.89!

All Detroit super-stock cars and sports cars to date have been equipped with brakes that are no different than those used on less potent standard models. The Fury follows this practice although heavy duty, fade-resistant linings are available. The 11 x 2 inch center-plane brakes used on the Plymouth are exceptionally good by Detroit standards. They are powerful and show little tendency to pull to the side. One brutal test that is highly revealing is a hard stop from 100 mph or better. Many cars will have *no* brakes left after one stop like this, but our Fury's binders suffered little from this punishment. The ten-stop fade test from 60 mph told a more critical

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Plymouth Fury R.T.

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story. By the fifth stop there was a 42 per cent loss of braking power and only about one inch of pedal was left. After the sixth stop we let the brakes rest for exactly one minute and on the next stop they had bounced back to 85 per cent of their original effectiveness. They are good brakes; they're not fade-proof but they recuperate fast.

Our observer who reads the decelerometer during these tests is in the habit of bracing himself against being flung forward violently when the brakes are jammed on. But after our first emergency stop in the Fury he looked up with a broad grin. The instrument told him that we had braked very hard, but he had hardly needed to brace himself at all. Under the hardest braking the Fury did not nose down perceptibly.

Another key to the new Plymouth's improved handling is the adoption of ball-joints in place of pivot pins in the front suspension. The old style suspension allowed only slight positive or negative caster adjustment, and this no doubt involved a certain amount of binding at the pins. But a ball joint is virtually impossible to bind and the new front suspension permits as much as 2.5 degrees of positive caster.

The more positive caster you have, the stronger the car's self-righting tendency on coming out of turns and the more resistance there is to putting it into a turn. As a concession to the lazy driver Detroit generally favors negative caster, which implies less effort to begin the turn. Other factors, such as king pin inclination, can ease the chore of getting out of the turn.

In the past, the average Chrysler product has had an available range of caster running from minus 0.5 to minus 1.75 or 2.0 degrees. With manual steering the adjustment was set well on the negative side but, even with power steering to do the work, little positive caster was available. This contributed to the dead and flaccid character of Chrysler-product steering response as we've known it in recent years.

With the new setup and with power steering Plymouth uses 0.75 degrees of positive caster, which livens the steering response. Manual-steering cars are set at 0.75 degrees negative caster. However, the owner who wants strong self-righting action coming out of turns can have up to at least 2.5 degrees of positive caster by simply adding dealer-available shims between the upper control arm inner pivot brackets and the frame sub side-member brackets. It's easy to tailor this part of the steering to your personal preference.

Plymouth's '57 bodies are very controversial and we were showered with unsolicited opinions on the Fury's styling. All observers were in agreement on the attractive cleanness of the design. But there were no vague opinions on the fins: they excited either strong acceptance or total rejection. Sales figures are proving that the wedge profile of the Chrysler family of cars is a hit on the market.

The Plymouth is styled to "read" as long and wide as possible, the body dimensions at the fender line being very close to the outer bumper dimensions. The greenhouse comes very close to matching the full body width and consequently there's adequate interior space for seven or even eight occupants of average size. Padding is necessarily thin over the shaft tunnel. The steeply-raked wraparound windshield is pleasantly free from distorting effects. The windows are almost flush with the outside of the windshield and roof pillars, which is a factor in reducing wind noise. It's possible to drive this car at 100 mph with the windows down and *not* be buffeted unpleasantly by the wind. In a great many cars wind-drumming can become unbearable in the passenger space at 50 mph if one window is partially open.

Eyebrows over headlights are used widely because they make cars seem longer. This is their only excuse for existence and it must be admitted that, as used on the Plymouth, they make for a well-balanced composition. But they exact a heavy price in terms of wind drag at high speeds and just sit there consuming power and fuel. We'd like to see this basically-clean body evolve into a shape similar to that of Chrysler's experimental Dart.

In our opinion the '57 Plymouth is a beautiful car, designed with excellent taste. The Fury is the best-handling U. S. production sedan we know of. It is a fast car but not grotesquely so. It has very strong acceleration with automatic transmission but must be re-cammed if optimum performance is to be enjoyed with a manual-shift box. Its fuel consumption is moderate at steady low speeds but this is not a car that wants to be driven with a light foot; you'll do well to get 14 mpg on an average run. The brakes are better than average for Detroit, the ride is superlative. Like all the rest, the car has a bug or two. And it has some virtues that its competitors are unable to match.

—Griff Borgeson

By Hand

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The rear suspension follows a practice that is well proved, although perhaps not as popular as it once was. Two trailing quarter elliptic springs carry the solid MG rear axle and final drive unit. Torque and braking reactions are controlled by outboard radius rods. The method of attaching the springs and radius rods to the rear axle is of special interest. Box-type brackets are fabricated of sheet stock and welded to the axle housing top and bottom, at the same point that originally carried the stock spring hangers. The upper brackets, about six inches in length, carry the trailing end of the radius rods. The lower brackets, slightly longer than those at the top, accommodate the spring eyes of the quarter elliptics. This is in effect a Watt's link and its action under braking and acceleration is easy to evaluate. Under acceleration the tendency is for the axle housing to rotate in the opposite direction of the wheel. The forces exerted against the radius rod are, of course, to the rear and have the effect of transfering the weight to the rear. Weight transferance under severe braking is to the front, but

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Last Mille Miglia?

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time he arrived at the next control at Pescara, was leading the German by two minutes and 41 seconds! Collins managed to hold the Italian off all the way to Rome —the gap between second place being 5 minutes and 27 seconds. Portago held fourth position with Gendebien screaming along in the 3 liter Gran Tourismo Ferrari in 5th spot. The race was turning into a parade of Ferraris. Collins got to Rome in 5 hours, 3 mins., 11 secs.; Moss had taken just 5 hours, 3 mins., 5 seconds in 1955.

Ak, meanwhile, was having a ball of his own—albeit a short one. Nevertheless he was treating the populace to the violent noise of El Caballo's hustling Chrysler. Running like a top, El Caballo was passed once by Taruffi, and Ak, forgetting himself for the moment, accelerated to keep up with the flying Roman. The Chrysler fairly leaped ahead and with Doug shooting the gun camera, practically ran up over Taruffi's tail. Ak decided then that it was the better part of valor to let Taruffi show him the way, rather than the other way around. Just about then, however, things started happening. Ak heard a "clunk"—a brake drum had broken. Continuing slowly along the Adriatic coast, the exhaust manifold suddenly came adrift. It was then that he realized what a pounding the car was taking from the horrible roads. Slowing now considerably, they had no real hope of finishing within the maximum time allowed, so they stopped, found a small garage, and did some spot welding. Then, turning around, they motored back to Brescia—the race for them over. They had only covered approximately 300 miles, but they were not alone. A strong Mercedes team of privately entered 300SL's all went out in the early stages of the race due to the failure of a bolt holding on the generator—said bolt entering the water jacket—it got loose and all the water came out.

The race among the Ferraris continued North from Rome: Collins continually in the lead, guided by his co-driver, Louis Klementaski. This particular stretch of the route is considered by some to be the most difficult; you traverse the Radicofani pass, the road winding incessently over the main highway north. Viterbo, Siena then on to Florence. Near Siena, Taruffi began to have trouble with his rear axle; Collins still led but Von Tripps moved up into second place while Taruffi was stationary by the side of the road. Collins was maintaining an average speed superior to that of Moss in 1955; the old record was 99.5 and Collins was maintaining 100.3 mph, but from Florence on, his speed dropped.

The Futa and Raticosa passes were crossed and the roaring Ferraris flew into Bologna—Collins still holding a good margin over Taruffi of 10 min. 43 seconds. Seven min. and 16 seconds farther back came Von Tripps and after him Gendebien, in the Gran Tourismo Ferrari, who was even leading Portago at this point. Gendebien was driving a fantastic race—up to Rome he had averaged 101.9 mph —at one point he even led Flockhart's D

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apparently this has little noticeable adverse effect.

The rear shock absorbers are Ford telescopic units and for convenience of mounting are tilted forward. The quarter elliptic springs are made up of Ford front springs cut so that the center bolt holes could be used in hanging them in the new position.

The braking system is hydraulic with two leading shoes used front and rear. A TC MG master cylinder is mounted on the firewall and is operated by a pendant type lever. The front brakes are TF MG and incorporate Al-Fin drums. In the rear TC units are modified to two leading shoe and Al-Fin drums are used.

The MG engine is of the type that is known as the "factory competition" model. Specially cast, the block comes as close to 1500 cc's as is mechanically possible. The water passages through the head and block have been rerouted, eliminating the head gasket and the overheating problems that were encountered with the earlier engines. Rated by the factory at 82 BHP @ 6500 RPM in stage four tune, it has wonderful reliability but is handicapped by its weight. By raising the compression ratio, lightening the valve train and very careful assembly, Hand has managed to squeeze 90 bhp from this unit.

The low mounting position of the engine made it necessary to construct a new oil sump. This was made as flat as possible, is very wide and has a capacity of nine quarts. An ingenious system is used to cool the oil that employs the core from a regular car heater as an oil radiator. To avoid pumping oil at high pressure through this core, which was not designed for it, Hand built a separate pumping system. A regular MG dual gear pump was cut in half and attached to the stock pump. This picks up from the sump and delivers oil to the radiator after passing through a pressure regulator valve set for thirty pounds. Engine oil pressure is maintained at 75 pounds per sq. in. Trouble was experienced with leaking rear main seals. This was cured by turning the crankshaft and modifying the block to accept a Ford 60 seal. The flywheel is alloy, machined from a heat treated aluminum plate.

An interesting fact about this engine, in common with a good number of the better engines running on the West Coast, is that the highly stressed parts are shot peened. It is felt that shot peening greatly improves resistance to metal fatigue and in some instances is more effective than the time honored high polish in preventing premature failures.

The body paneling consists of seven separate pieces, most of them easily removable by Dzus fasteners. The belly pan runs the full length of the car and is in two pieces to make the underside of the car a little more accessible. Sixteen gauge half-hard aluminum stock is used throughout.

This car leaves an indelible impression of the all-round ability of Bud Hand. None of the various techniques necessary in building a car seem to snow him. He says he just couldn't buy a racing car to sit in and drive, so perhaps his Santa Monica shop will soon turn out that front running Bud Hand Special.

Russ Kelly

Don Healey

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short of the trap. Coasting, Donald's timed average through the mile was better than 150 mph.

In contrast with the man who first drove over the brine at 300 mph (Campbell, 1935), Healey emphatically plays down the danger potential of such speeds on the salt. In fact, he says, it is the inherently high safety factor, and the almost nugatory physical exertion called for, that driving role up to, and if need be exceeding, 300 an hour. His one cardinal rule in this context is to let the car go where it wants to if a side wind hits it. The *lebensraum is there*, and then is the time to use up a bit of it.

The name Healey, originally standing in its own grounds and later hyphenated with Nash and Austin, is identified with such striking success, both commercially and in various forms of speedwork, that it's difficult to realize Donald's career as a car manufacturer only dates back eleven years. But personally, in association with a series of established British marques, he had made a reputation as a hard-headed and resourceful competition driver long before setting up as a constructor on his own account in 1946. As a Royal Flying Corps pilot in the first World War he hoped to make aviation his peacetime profession, but a flying crash and the resulting injuries enforced a change of plan. Instead, he pocketed his RFC disablement papers and returned to his birthplace, a townlet called Perranporth on the coast of Cornwall, England, where he bought himself a garage business. From this base he participated in the leading English trials of the twenties, serving a promising apprenticeship at the wheel of an ABC, a sprightly light car with two horizontal aircooled cylinders, like half a VW. He also drove this little two-banger at the old Brooklands track.

From the ABC, Donald graduated to a Triumph Seven, unrecognizable ancestor of today's TR3, and subsequently rang changes on later and larger Triumphs, Rileys and Invictas. When the Royal Automobile Club put on its first rally in England in 1928, foreshadowing a later British boom in this type of competition, Healey and his Triumph Seven won it outright. Encouraged, he raised his sights and took a bash at the Monte Carlo marathon the following January, getting his wheels in the groove for a run of Monte success that no other Briton has yet equalled — between 1929 and the outbreak of the second war his score in Europe's toughest snowfest included one straight win, one second place, one third, one first in the separate light car category and the only recorded instance of a car being cut clean in half by a freight train. The London *Motor* has described Donald as "all-time's greatest British contestant of Le Rallye . . . an ideal compound of resource, skill, guile and toughness".

In the light of his career on the Monte Carlo trail it isn't surprising that Healey regards record breaking at multiple century speeds as a tame and sedentary occupation. It may be that he himself has lost count of the number of times he escaped pulverization by a gnat's whisker in the rally, but the most miraculous of these near-misses was certainly his 1935 adventures on a Danish grade crossing. Driving a supercharged Triumph Dolomite straight-eight through a pitch dark night, and with patchy mist for extra hallucination value, his ear caught a sound that he took to denote a seizure of the blower. What he didn't know was that seizing Dolomite blowers sounded exactly like Danish freight train sirens, and vice versa. The impact, when it came, was oblique, and literally bifurcated the Triumph about nine inches ahead of the windshield. The front half, complete with the engine and the rest of the hood's contents, was ground to fragments. The back half, containing Healey and his navigator, was gently sideswiped out of harm's way and didn't even capsize. The navigator shook his head and one tooth fell out. Otherwise nobody got a scratch.

The *Motor*, in extolling Healey's skill and guile as a rallyman, wasn't just playing with words. In 1931, the year he won the Monte, his 4½ liter Invicta ran off the road soon after leaving Stavanger, his Norwegian starting point, and cut a telegraph pole down to bumper height. The blow threw the whole chassis out of line, giving the steering a powerful bias a-port and leaving one front brake for dead. Under these handicaps, Donald and his co-driver not only made it to Monte on time over 1700 miles of snow and ice-bound roads, but Healey himself beat the entire field in the decisive eliminating test on arrival. This was, of all things, a braking test.

The following year the decider took the form of a top gear flexibility test. Finding nothing in the regulations to forbid such a manoeuver, Healey had a pair of dime-size back wheels and tires shipped down to Monte in advance and fitted them to his Invicta before showing for the test. These wheels were so small that with the tires flat the chassis touched the ground. On his trans-Europe performance he was favorably placed to win the rally outright for the second time running, but it transpired that Vaselle, one of the Hotchkiss factory's Monte Carlo virtuosi, had stopped off at his sponsors' Paris plant and switched to an ultra-low axle ratio. This even smarter dodge enabled Vaselle to beat Healey on so-called flexibility and thereby win the rally.

Final tests, in which even seasoned operators are liable to be afflicted with agonizing stage fright, always found Donald as happy as a baby in a pram. His serenity and detachment preceding and during these ordeals was the wonder and envy of mercurial Latin rivals and accounted for much of his success as a rally driver. In addition to his Monte Carlo prizes, he also won both the Austrian and Hungarian alpine trials for Invicta.

Healey returned to his old love, flying, in the second World War — commanding a regional wing of the Air Training Corps in England. During such leisure as his ATC duties afforded, he worked up de-

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signs for the car that was to carry his name, pooling his own down to earth practicality with the advanced technical and theoretical knowledge of an old friend, Achilles Sampietro. Sampietro had been an associate of Georges Roesch, designer of the classic Talbots in this make's pre-Rootes era, and is now with Willys-Overland.

The Healey prototype, powered by a slightly warmed version of the 2½ liter Riley engine, was on road test three months after VJ-Day and went into small scale production during 1946. In its three variants—roadster, sedan and convertible—this Riley based car kept Donald's little factory busy until 1952, when the need for increased dollar business led to the introduction of the Anglo-U.S. halfcast known as the Nash-Healey.

By dint of a roofline that discouraged the wearing of hats in the back, plus a general contouring that wasn't far behind the Italian thinking of the day, the 2½ Healey sedan achieved a low overall drag factor. This was effectively demonstrated when, soon after the original launching, it hit an independently timed speed of 104 mph on an Italian autostrada of far from perfect surface, thereby establishing itself as the world's fastest stock passenger car. (Stock models had, of course, exceeded this speed pre-war, both in Europe and the U.S., but the ones in question were not still in production).

Healey happened to be in Italy at the time of the first post-war Mille Miglia, in June of 1947, and the fact that the winning Alfa, driven by Biondetti and Romano, averaged the relatively modest speed of 69.58 mph, sent him off into a brown study. Upshot of these musings was that he led a three-car expeditionary force to Brescia for the race in '48. Donald himself, sharing a roadster model with his eldest son, Geoffrey, finished ninth on general classification, averaging over 100 miles per hour for a 150 mile stretch of autostrada; Count Johnny Lurani headed the whole touring category, irrespective of displacement, with a Healey sedan; and the third car in the team broke its transmission. Another closed Healey, stoked by Tommy Wisdom, the well-known British motoring writer, again pulled off the touring class in the next year's MM.

Don has driven in five post-war Mille Miglia—a stoutish effort for a man who was in his fiftieth year before he even learned his way around the mighty Brescia-Rome-Brescia lap. It was in the 1953 race, at the wheel of a Nash-Healey hardtop, that he hit a bridge parapet at ninety, ejecting his co-driver through the windshield. The pane, being fortunately framed in rubber, didn't put up a lethal resistance.

Staunchly pro-American, Healey takes pride in the fact that it was his product that first whetted Briggs Cunningham's appetite for racing. Briggs' personal debut in speedwork was made on a Silverstone Healey with a Cadillac V8 engine fitted in place of the regular Riley four-lunger, and prolonged experiments with this combination preceded the establish-

continued on next page

Don Healey

continued from preceding page

ment of Cunningham as a marque in its own right.

When the idea of welding a big-displacement American powerplant to his own chassis first occurred to Healey, he had his eye on the Cadillac V8 engine. Tentatively, GMC thought they might be able to make available the few units he'd need, and he was invited to Detroit to discuss the project with Charles Wilson, the present Secretary of Defense, who, at that time was president of General Motors. En route to New York by sea, Donald chanced to make the acquaintance of George Mason of Nash-Kelvinator. Drawn together by common interests, the travelers struck up a friendship, and the object of Healey's trip came out in conversation. Before they parted, Mason made it known that he would be happy to supply Nash engines instead if the Cadillac parleys came to nothing. They did, and that was how Healey came to have his name hyphenated with Nash.

Although the Nash engine, being inferior to the Cad in both displacement and specific output, gave the Healey a performance that in retrospect seems not far removed from the bovine, it served its purpose adequately at the time. High-point of the Nash-Healey's career in sports car racing was Le Mans, 1952, when the one driven by Wisdom and Johnson placed third, several parishes behind the two survivors from Stuttgart's threesome team of 300SL Mercs. More importantly from the commercial standpoint, the big advertising noise made in the U.S. by Nash-Kelvinator paved the way for the cut that Healey was later to make at the American cake with his smaller Austin-Healey Hundreds. About 1200 Nash-Healeys were built, all but a handful of them going to the U.S. market.

Without exercising any of the back-slapping winsomeness of a Dale Carnegie disciple, Donald Healey somehow always seems preordained for support from the right friends at the right moment. A case in point was the way Sir Leonard Lord (then plain L. P. Lord) fell into his lap, so to speak, at the crucial moment of the debut of the Healey Hundred. On his own initiative, and without any effort at enlisting outside backing. Healey laid down an all-new chassis and body design in the summer of 1952. For this car, christened the 100, he had negotiated the purchase from Austin of surplus A90 engines, as used in Longbridge's already obsolete Atlantic hardtop. As head of Austin, Lord was of course fully in accord with this transaction, but his personal interest in it, right up to the time the 100 was unveiled at the annual London automobile exhibition in October, was nothing, net. Then, at the Earl's Court show, it happened. Lord came, saw and was conquered. Convinced that Healey held an ace, he immediately offered to transfer production of the 100 to Longbridge and put Austin's international distributive machinery to work on its behalf. The deal was concluded almost overnight, and the car that had entered the show hall as a Healey acquired its Austin prefix right there on the stand.

This alliance transformed Healey's fortunes and scale of operations, and during its four-year lifespan the four cylinder 100 had the fairly unusual distinction of maintaining a demand that constantly outstripped supply. Fourteen thousand of these brisk two-seaters were exported to the States, nourishing the BMC exchequer to the tune of $20,000,000. From the moment of the Lord-Healey handshake, Donald's small plant at Warwick, where all his earlier cars had been built, was relieved entirely of manufacturing and assembling processes. It is presently devoted to service, tuning for competitions, prototype development and conversions from stock specification to the faster 'M' formula.

Of late, the marque is busy producing Austin-Healey 100-6's, introduced last fall to replace the four. In February, 160 of them were coming off the line per month, and Donald hoped shortly to step this to 200. Performance-wise, there was perhaps an augury of future possibilities in the speeds put up in Utah last August by a special-bodied variant with three double throat carbureters and a nine to one compression: figures for 200 miles and 500 kilometers, both breaking international class records, were above 152 mph.

As busy as a bird dog from dawn to dewy eve, and therefore a happy man, Healey currently divides his time about equally between his car and powerboat interests. His trans-ocean travels between Britain and the U.S., which weren't exactly desultory when he only had cars on his mind, nowadays approach fanbelt tempo. Healey Marine, his boat enterprise, has beachheads in Canada and the Bahamas, as well as in England, and is growing all the time. This company's products, like those of its car associate, enable Donald to combine a business with a hobby; water skiing, one of the purposes for which his craft are designed, is a favorite diversion of his. Like record breaking on salt, it is, he says, essentially safe because there isn't anything or anybody to run into, which makes it a hand-picked pastime for men of an age past their Monte Carlo prime.

Dennis May

Last Mille Miglia?

(Continued from page 59)

type as well as Scarlatti in the 3 liter Maserati.

From Bologna the road gives the cars and drivers a break; it is flat country and the Via Emilia running north from Bologna through Modena and Parma is the home stretch—where the cars are fully extended. Collins made Modena, then, as he reached Parma, the race ended for him. His back axle had packed up. Taruffi swept into the lead, now with Von Tripps breathing down his neck in the only 3.8 liter Ferrari. Taruffi's car was far from perfect and Tripps found he could just barely get by the wily Italian if he wanted to. Tripps passed once, but Taruffi caught him and waved him back, giving him the "caution" sign. Now they were through Mantua, the town of Nuvolari, and flat out headed for Brescia, their tachometers reading close to 9000. Portago and co-driver Nelson were also fully extended, holding third place when the catastrophe happened. Due to either a blown tire or a rear axle shaft failure, their Ferrari went out of control while roaring down a straightaway near Guidizzola. Ripping through a group of spectators, the machine smashed into a high tension pole, flipped and careened for another 300 feet before coming to rest in a ditch. At least eleven people were killed on the spot, including five children.

Gendebien went by—then Maglioli in the Porsche. Crossing the finish line less than a car length apart, Tripps and Taruffi brought Mille Miglia victory home to Ferrari. For the 51-year-old Taruffi, it was the culmination of an effort extending over the better part of his career.

For my money, the real hero of the day was the Belgian, Gendebien; driving his Gran Tourismo Ferrari, he won the Gran Premio Nuvolari—for the fastest time over the road from Mantua to Brescia. His time was a new record—even beating the 1955 Moss time of 123 mph. Gendebien ran the distance at a speed of 123.6 mph, this doesn't sound like much, but when you consider that the 3 liter Ferrari is "only" a Gran Tourismo machine then one can have nothing but admiration for Gendebien.

As far as tires were concerned, only Collins had changed. Taruffi ran the whole race on the same set—likewise Von Tripps.

Ak Miller's effort was really admirable, despite the outcome. It is men like Ak and his co-pilot, Doug Harrison, that make motor racing what it is today. Without these sincere, intensely devoted people, we would have nothing. It is true perhaps, that in the current atmosphere, too many people are "out for blood", so to speak—and not enough people out for fun; but then, on the other hand, European racing is professional racing. Ak and Doug had fun. They know now what it is all about over here. It was far from being time and money wasted, despite the frustrations and numerous obstacles. They might decide to come back to Europe some day, and when they do it will be with a car designed from first hand knowledge of what it takes to win a race like the Mille Miglia.

—Jesse Alexander

Portago

(Continued from page 15)

ranked Portago:

"He's certainly among the ten best in the world today," Moss said, "and as far as I'm concerned, he's the one to watch out for."

In Cuba, just before Sebring this year, he was leading Fangio by a respectable margin when a gas-line let go again.

"I don't think anyone will be champion as long as Fangio competes," Portago told me. "If the absolute limit of adhesion of the car through a certain bend is 101.5 miles an hour the old man will go through at 101, every time. I may go through at 99, or 102—in which case there'll be an incident.

"Moss is of course better than I am, too. If I pass Moss, I wonder what's the matter with his car! But I'm learning still, I think I get a little better with every race. I hope so, anyway."

Portago ranked Collins, Behra, Schell, Musso and himself after Moss as equals. He carefully repeated his estimate of Schell: "Harry is very, *very* fast," and then said that he considered Schell his closest friend. They spent much time together. Both appeared to be tense, more accurately, taut, something that was not in any way allied to nervousness but was instead a peculiar expression of awareness. Like Portago, Schell walks rapidly, he turns his head constantly, he seems to be trying always to see something that is just out of sight, to hear something that is just out of ear-shot.

I said as much.

"It sounds corny," Portago said, "but I think that because racing drivers are very near to death every Sunday in the season, they are more sensitive to life, and appreciate it more. I take it that is what you meant by what you called "awareness" when you saw Harry and me walking together. Speaking now only for myself, I'm sure I love life more than the average man does. I want to get something out of every minute, I want no time wasted. You know, people say that racing drivers are daredevils who don't care whether they live or not, and you've seen stories about me and my flirting with death and all that. Nonsense, all nonsense. I want to live to be 105, and I mean to. I want to live to be a very old man. I'm *enchanted* with life. But no matter how long I live, I still won't have time for all the things I want to do, I won't hear all the music I want to hear, I won't be able to read all the books I want to read, I won't have all the women I want to have, I won't be able to do a twentieth of the things I want to do. And besides just the *doing*, I insist on getting something out of what I do. For example, I wouldn't race unless I was sure I could be champion of the world."

"Can you imagine yourself driving when you're Fangio's age?" I asked him.

Portago smiled. His mouth was unusually small, and straight-lined, and his smiles were brief, but warm enough. "Never," he said. "Certainly not. In any

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Portago

continued from preceding page

case I'll stop when I'm 35, and if I'm champion of the world, sooner."

"And then?"

"Well, I'm very ambitious," Portago said. "I wouldn't be racing automobiles if I didn't think I could get something out of it, and not only the championship . . ." The phone rang beside me. It was Portago's Caracas call and I handed the instrument to him. I had passed the open switchboard in the lobby an hour before, when he had placed the call, and I had overheard the operator, so I knew to whom the call was going and I knew it would be personal.

"I'll take a walk," I told him. "Call me."

"Please," he said. "Don't go. Please. Anyway I'm going to speak Spanish."

As it turned out, the call was a report that the party in Caracas was unavailable.

"Forgive me," he said. "I didn't mean to be rude, I didn't mean to suggest that naturally you wouldn't speak Spanish. I'm sorry."

I told him that he was right, in any case. "We were talking about what you intend to get out of automobile racing," I said. "I had the impression that you thought of it as preparation for something."

"I do," Portago said. "I haven't told this to a great many people. You see, Spain has had no new national hero for many, many years. That is what the championship of the world means to me. When I give up racing I'm going to Spain and go into politics."

Later, from Paris, Portago sent me a photograph of himself and Fangio and the Pretender to the Spanish throne. But on it he had written, "With Fangio and Don Juan, the *future King* of Spain."

The rumor that Franco intends the restoration of the Spanish monarchy has been knocking around the world's chancellories for several years. Portago seemed very sure. For all I know, he may have had superior information.

His frank statement of the purpose to which he intended to put the championship amused me. A few minutes before he had been strongly critical of another driver who has some public business ventures: "He's commercialized himself so much," Portago said, rather disdainfully.

Still, one never expects consistency in anyone who gets his head above the ruck. Consistency is one of the marks of the drudge. Portago was of course a cynic and I have no doubt he thought himself skilled in the management of other people—reporters included. If he did, it was a new idea for him, a product of the past two years, because he conceded that he had during most of his life been very shy, highly introverted, and that he had occasionally covered it with action that could be interpreted as rudeness. Certainly he was enormously perceptive, and conversation with him was easy and pleasant. He obviously knew that real conversation can concern itself only with *ideas*, not *things*, and I think that like all first-rate minds, his natural preference was for ideas; he knew that it is necessary to listen, and he could be forthright, even in response to rough questions.

"Portago was married in 1949 to the former Carol McDaniel, a South Carolina girl. They have two children, Andrea, six, and Antonio, three. Two hours after he had met Carol McDaniel Portago told her he intended to marry her. He had discovered even earlier in life that women respond to daring as to nothing else—to daring, to indifference, to arrogance and certainty and sensitivity, and in one sense at least women were more important in his life than anything else.

"The most important thing in our existence is a well-balanced sex-life," he said to me. "Everybody knows this is true, but nobody will admit it—of himself, that is. But if you don't have a happy sex life you don't have anything.

"It's the first thing the historians suppress when they write the lives of great men," I said, "And it was often an astonishingly big factor in their lives."

"Of course," Portago said. "Look at Nelson, look at Napoleon."

"Well, look at George Bernard Shaw," I said, "Who gave it up altogether, and married on condition his wife would never mention sex to him."

"A freak," Portago said. "A very untypical writer. Look at Maupassant. A prodigy, in more ways than one. Well, as for me, making love is the most important thing I do every day, and I don't care who knows it."

Portago was willing to maintain his opinions under most circumstances, whether by debate or a right cross. I had heard that he had once challenged a man to a duel, but he denied it. He had fenced rarely, he said. He was taught boxing by Edmund Nelson, who died with him in the Mille Miglia. Nelson was a British ex-boxer who was just out of the Merchant Marine and working in New York's Plaza Hotel when Portago, still in his teens, resided there. It was Nelson who taught Portago bobsledding—the first time Portago went down the St. Moritz run he went down steering, and he took 15 seconds off the time of the then champion of Switzerland—and it was Nelson who said, "I know Fon says he'll live forever, but I say he won't live to be thirty."

It is not on record that Portago lost many fights. He was always in condition. He ordered milk at most of the world's best bars. He smoked constantly, but never inhaled. His reactions were freakishly fast, beyond normal to an extent that even he apparently didn't appreciate. He once remarked after a car had spun with him, "It went very slowly. There was lots of time to think." Another time, speaking of steeple-chasing, he said, "When your horse falls after a jump you look around for another horse to hide behind."

Recently in Paris Portago stepped off a curbstone as a Citroen went past, much too close, Portago felt, to the feet of the lady he was with. He flipped a cigarette at the driver so quickly and so accurately that he hit him in the face with it. The man got out and Portago knocked him down twice. He handled his own defense in the consequent law proceedings and was thoroughly trounced by the plaintiff's attorney.

"I hate to fight," he told me. "I'll do anything honorable to get out of a fight, but I get into situations in which there is no way out. I was with some friends, they were shipping people, and a man called them 'a bunch of bloody pirates.' I'm afraid I hit him. Another time I suggested to a man on a dance-floor that it might be nicer for everybody if he put his cigar away when he danced. He'd already burned a friend of mine with it. When I started to leave the place, later, two of this cigar-lover's friends stood in my way and wouldn't move. What could I do, once I'd asked them please to let me by? I lowered the boom on them."

We talked of a good many things that don't much matter now, in the time that we sat in that room. It had rained hard during the night, but the sun was steaming it off now, and outside we could hear cars slowing for the corner around the hotel that led to the circuit. Two team Maseratis came past, the mechanics who drove them blipping their engines incessantly.

"Genuine Italian-type sports cars," I said. "Suitable for summer touring."

Portago grinned. "This is an easy course in one way," he said. "There's only one genuine fast bend in it. But the flat corners, the way it ruins brakes. . . . A race I don't like is the Mille Miglia. No matter how much you practice you can't possibly come to know 1,000 miles of Italian roads as well as the Italians, and, as Fangio says, if you have a conscience you can't drive really fast anyway. There are hundreds of corners in the Mille Miglia where one little slip by a driver will kill 50 people. You can't keep the spectators from crowding into the road—you couldn't do it with an army. It's a race I hope I never run in."

"I have a quotation in a story, a piece of fiction that won't be published until this summer," I told Portago, "something that I thought at the time I wrote it you might have said: that of all sports, only bull-fighting and mountain-climbing and motor-racing really tried a man, that all the rest are mere recreations. Would you have said that?"

"I couldn't agree with you more," Portago said. "You're quite right. I've thought of bull-fighting, of course, but the trouble is that you must start when you're a child, otherwise you'll never really know the bulls. And the only trouble with mountain-climbing for me is the lack of an audience! Like most drivers, I'm something of an exhibitionist."

Portago and I had promised ourselves a certain length of time. We had run an hour past it when he stood up and I shut off the wire recorder. We shook hands and said good-bye. I saw him three times more, very briefly, before the '57 Sebring was over and everybody had dispersed. In April he sent me a note from Paris to say that he had won at Montlhery beating sports cars with a *gran turismo* car, and breaking the lap record. He said he was going to run in the Mille Miglia and at Monte Carlo.

I did a draft of the story and sent a copy of it to him in Paris, as I had offered to do—but not before we talked. I'm not sure he ever saw it, because I heard from him next from Modena. Finally, the day before the race, a cable came from Brescia, asking if I could use his first-person account of the race. Obviously he intended to live through the Mille Miglia now, although earlier he had written to Dorian Leigh, an internationally famous beauty with whom he had had a close relationship, a note that had suggested premonition: ". . . As you know, in the first place I did not want to do the Mille Miglia. Then Ferrari said I must do it, at least in a *gran turismo* car. Then I was told I had to do it in a new 3800 cc. sports car. That means that my 'early death' may well come next Sunday . . ."

He told a reporter that he was intent only on finishing, that it was important to him to come back to Brescia "safe and sound," an obvious reference to the fact that someone was waiting for him. But when he got out on the road, Nelson hunched enigmatically beside him, Portago began to go, and he was fourth at the first check-point. When a broken half-shaft put Collins out at Parma, Portago began to try for second place, and he was straining for a sight of Von Trips' car, lying second to Taruffi, when the tire blew at something between 125 and 150 miles an hour on the straight at Guidizzollo, and the 3.8 Ferrari, a model he loathed, lifted its wheels off the road and left him helpless. The car killed him, it very nearly destroyed his body, it killed Edmund Nelson too. When I heard that he was dead, I looked for a note he had sent from Paris: ". . . I don't plan to return to the States until October. Please let me know where I can get in touch with you in New York as we must get together at least for a couple of lunches . . . All the best, Fon." Later I heard one good thing: The magazine *Sports Illustrated* had asked Portago to write a piece about racing and he had done so. In Cuba he had asked the journalist Diana Bartley to read it over for him and make any changes she thought would improve it, but Miss Bartley did very little with the piece, and it was, as it was printed, pretty much as it came from Portago's typewriter. It was an attempt to state the motivation, and something of the philosophy, of a driver, and it was an honest and lucid piece of writing. It was published the week of the Mille Miglia, and Portago read it in Brescia and cabled New York to say that he had seen it, liked it, and that he would be happy to do more for the magazine in the future.

Except for the final seconds after he lost the car, seconds that must have seemed so long to him, Portago's last hours were happy ones: Once he started running he would have set aside all premonitory fears, he was doing what he wanted to do, and doing it far better than the form-chart said he possibly could. He was surely thinking, as he screamed down the Valley of the Po toward Brescia and the finish, that he might conceivably win the race.

Most men die regretting the errors they have made in the multiple choices that life forces upon us, and Portago knew, in the fraction of time in which he could think about it, that error was killing him. Motor-racing, like every other human endeavor, rigidly reserves the ultimate reward for those who are talented, lucky—

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Portago

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and totally devoted. Portago was enormously talented, he was luckier than most, but he did not have, in the fullest measure, the vital ability to concentrate obsessively upon a single purpose. The gods, in which he did not believe, or fortune, or fate or something else for which we have as yet no name, somehow guards those who do own this thing. Portago knew what it was, as many men do not, he often spoke of it—". . . you must have the mental strength to concentrate absolutely . . ."—but he could not maintain it as rigidly as, say, Phil Walters used to do, or Stirling Moss does today. He did not want to run in the Mille Miglia. A wiser man might have stayed out, even if it required an illness of convenience. He had not made even one practice circuit of the course, but he tried to out-drive men who could not remember how many dozens of times they had run it. Perhaps saddest of all, he over-ruled the Ferrari depot at Florence when he was urged to take two new tires for the run to Brescia.

In a sense, though, none of these things were mistakes, because actually Portago had no choice. There was no caution in him. A refusal to count odds was the essence of his nature. Usually he won, but he was intelligent and he knew that averages would almost certainly trip him ultimately. Knowing this, he still preferred to accept the hazard. That was his nature, the core of his being, and he could do nothing to alter it. Had he been cautious, we would never have heard of him. Portago's determination to take what he wanted out of the world, on his own terms and no matter what the price, present or potential, made him what he was: the absolutely free spirit.

"If I die tomorrow," he told me the day before Sebring, "Still I have had 28 wonderful years."

I cited to him the Spanish proverb, "In this life, take what you want—but pay for it."

"Of course," he said. "Of course, that's exactly it. You must pay. I remember someone who wrote about the British in the first World War, about the terrific mortality rate among young officers who had to lead bayonet charges against fixed machine-guns, and most of them, or many of them, were aristocrats in those days. They had a life expectancy at the front of 30 days or something like that. And this man, he was a journalist, I can't remember his name, said, I remember, 'In war, the British aristocracy pays for the privileges they enjoy in peace-time.' You pay . . . you try to put it off, but you pay. I think, for my part at least I think the game is worth the candle."

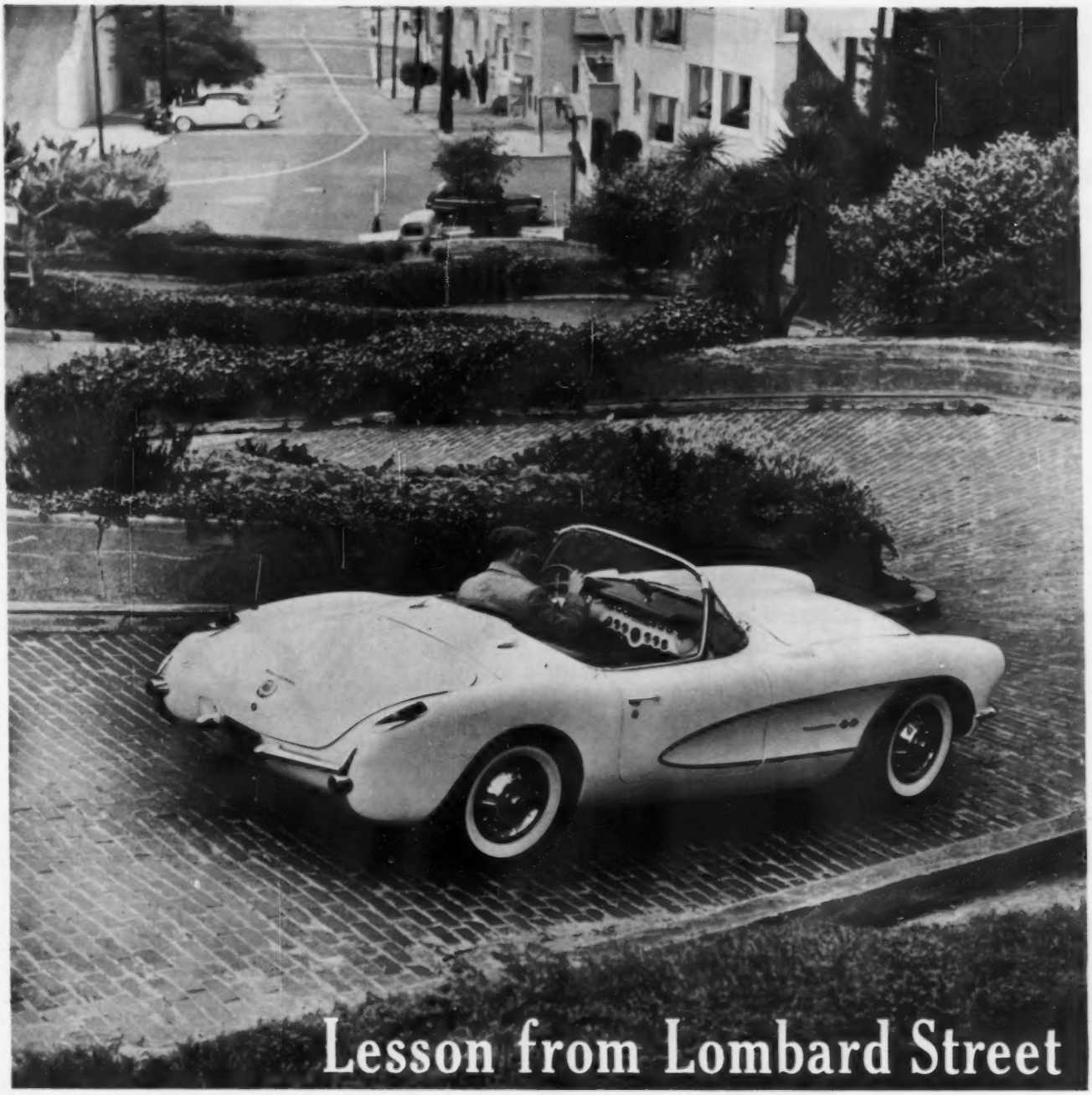
Portago was not a great racing driver, although it is certain that he would have been, had he lived, and that is not alone my opinion, but the judgement of men much more expert. He was not an artist, he left nothing of beauty behind him and nothing of use to the world. He moved no mountains, wrote no books, bridged no rivers. He saved no lives, indeed he took innocents with him to death. He could be cruel. If he wished to indulge himself he would do it, though the act hurt and humiliated others who had done him no harm or in any way earned his enmity.

Yet it would be a flinty heart that did not mourn his death. At the very least, he was an adornment in the world, an excitement, a pillar of fire in the night, producing no useful heat or light, perhaps, but a glory to see nonetheless. At most he was an inspiration, for, with the mere instruments of his life set aside—the steeplechasing, the motor-racing, wealth, women, world-roaming—he proved again what cannot be too often proven: If anything at all is meant for us, we are meant to live life, there is no folly like the folly of the hermit who cowers in his cave, and a dead lion is a greater thing than a live mouse.

The accomplishments of the 28 years of Don Alfonso Cabeza de Vaca y Leighton may make only a small monument for him, or none at all, but he knew what greatness knows, and for that reason we are the poorer for his going.

—Ken W. Purdy

Despite lacerated arm, cut to bone in bobsled accident three weeks earlier, Portago nearly won GP of Cuba, holding off Fangio until a fuel line broke.



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